



ADHD in Women: a clinician's
evolutionary bio-psycho-social
perspective
Dr David Chapman 2025





Adult Psychiatrist in Darwin - a refugee from the Public System now happy in part-time private practice, with a dash of academic psychiatry.

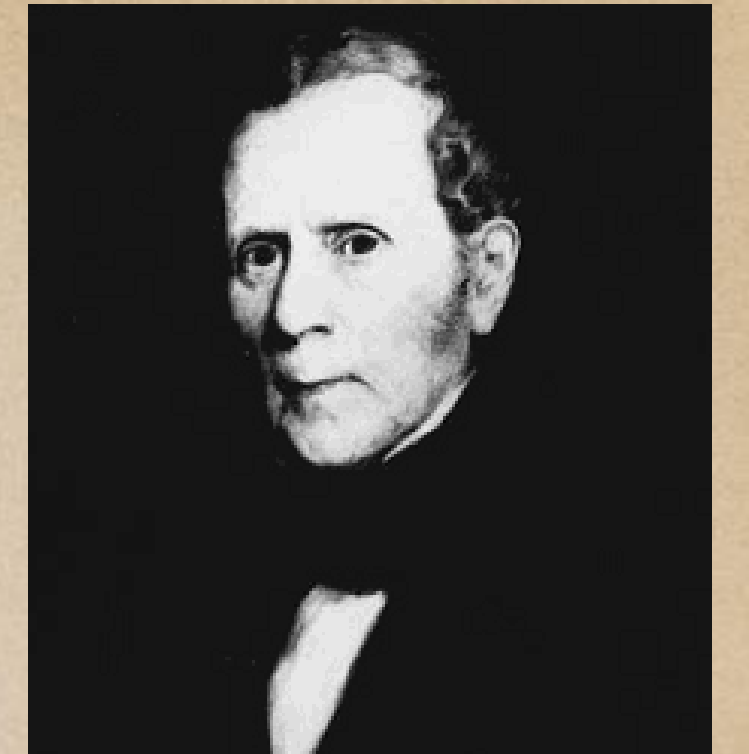
Special interests in ADHD and Women's Mental Health (& their intertwining - Collaborator in the ADHD in Females SIG of The HER Centre Australia).
Honorary Consultant in the Monash Alfred Psychiatry Research Centre (MAPrc)

Sometime recipient of conference and speaking support from Takeda

...& with grateful thanks to Professor Bellgrove for some slides, shamelessly purloined



ADHD - Yawn, Yawn; Nothing New



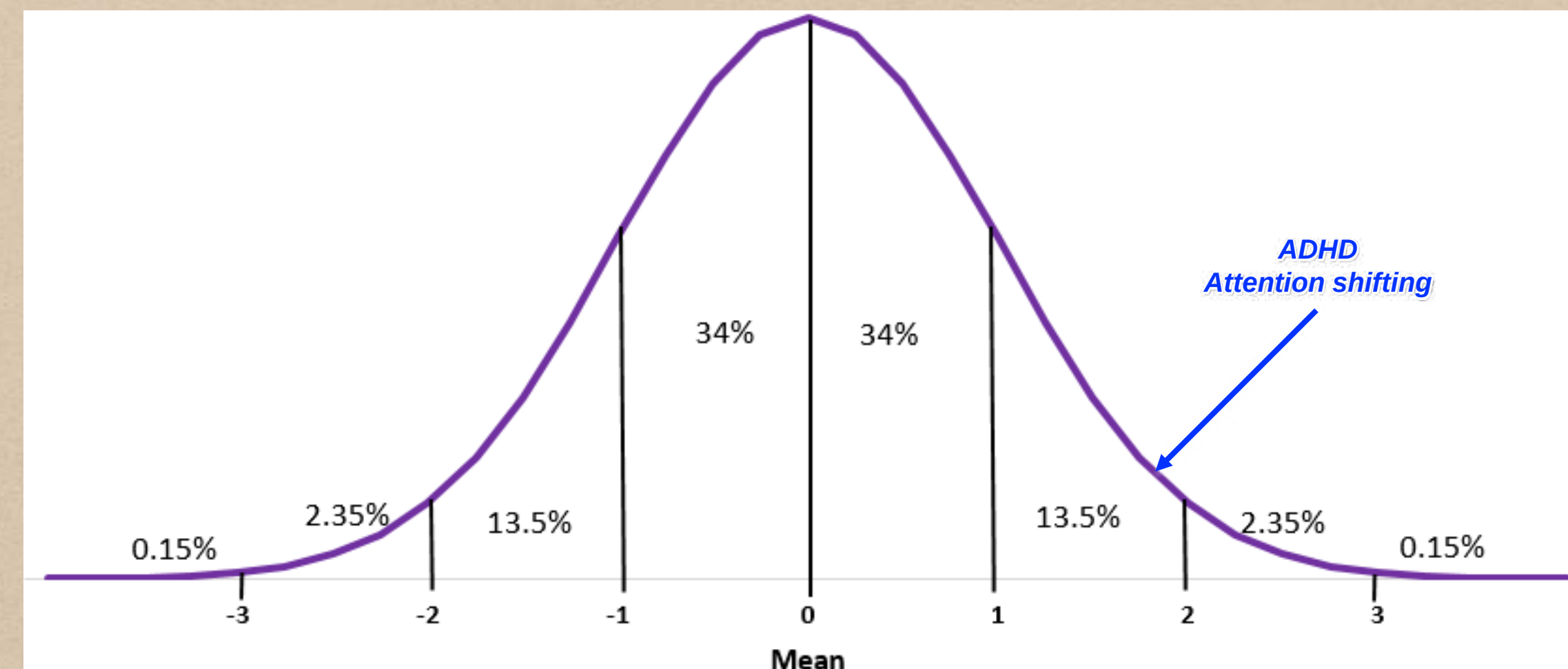
Alexander Crichton (1798): Mental Restlessness.

“every impression seems to agitate the person, and gives *him* an unnatural degree of mental restlessness. A slight noise, too much light, too little light all destroy constant attention in so much as it is easily excited by every impression”

DSM-5 (2013): “neurodevelopmental **disorder** characterized by a persistent pattern of **inattention** and/or **hyperactivity-impulsivity** that interferes with functioning”

AN EVOLUTIONARY PERSPECTIVE... ADHD *REIMAGINED*

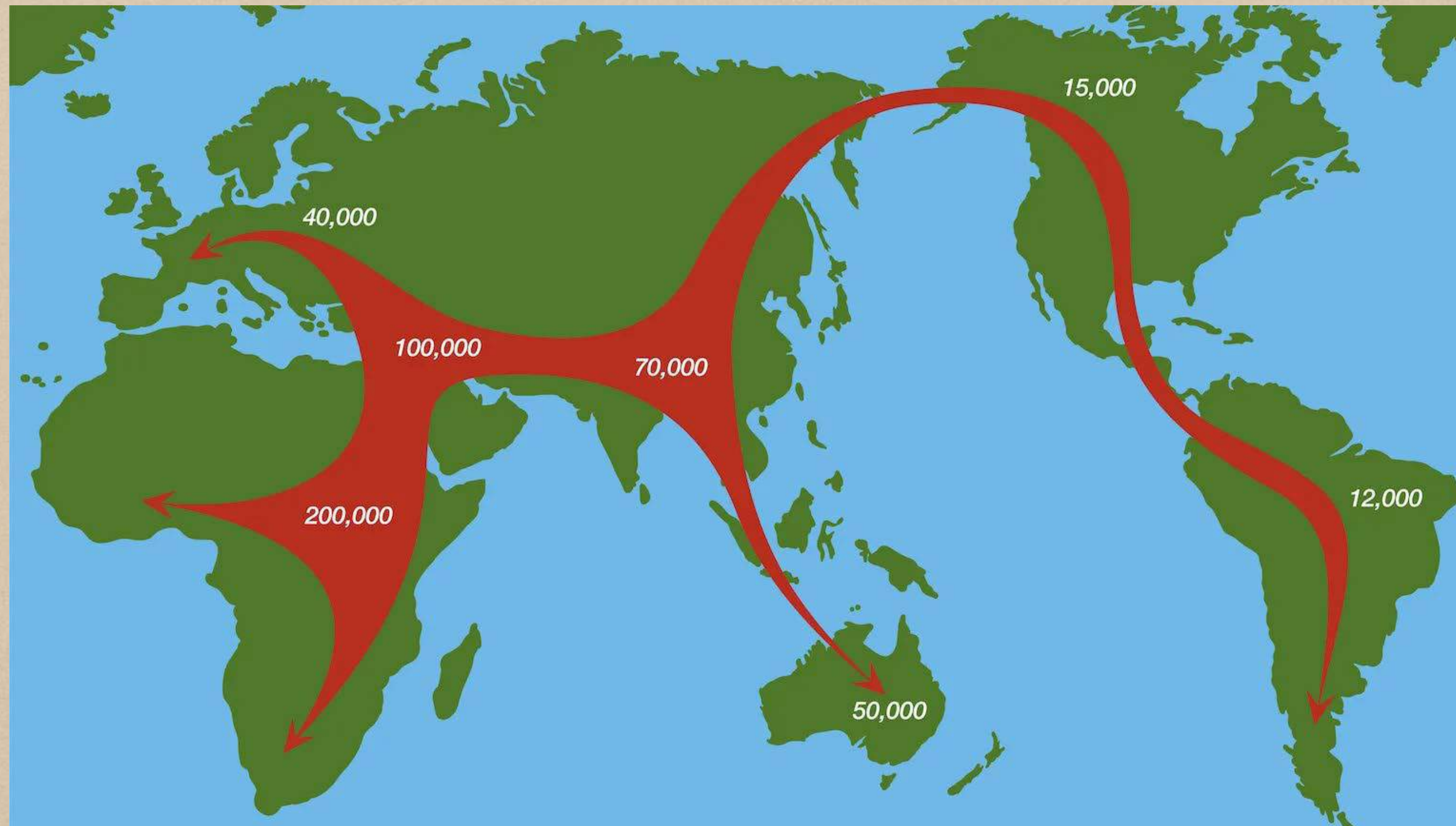
ADHD is acute sensory sensitivity coupled to the ability to rapidly shift attention from the safe, mundane, non-threatening to the unsafe, novel and threatening; and to persist in responding to that object of attention, to the exclusion of all else, until the threat or novelty is resolved.



Sensory sensitivity & speed of attention shifting

This expression of ADHD is sex determined...to a degree...

ADAPTATION & SURVIVAL



In the great diasporas in human history, who do you want by your side?

...OR IN THE GREAT REVOLUTIONS IN RECENT HISTORY...



Industrial Revolution
18th Century

Agrarian Revolution 10,000 BC



Social Revolution 21st Century?

Technological Revolution 20th Century



EVOLUTION - MOTHER NATURE'S INTENTIONS:-

In prehistoric societies



- ♀: responsible for social cohesion in group
- attractive women:
 - know how to relate & pacify
 - have strong social & communicative skills
- ♂: responsible for acquisition of nurture
- appealing men:
 - are detail geared hunters
 - do not interfere with social life in group

“The Social Glue”

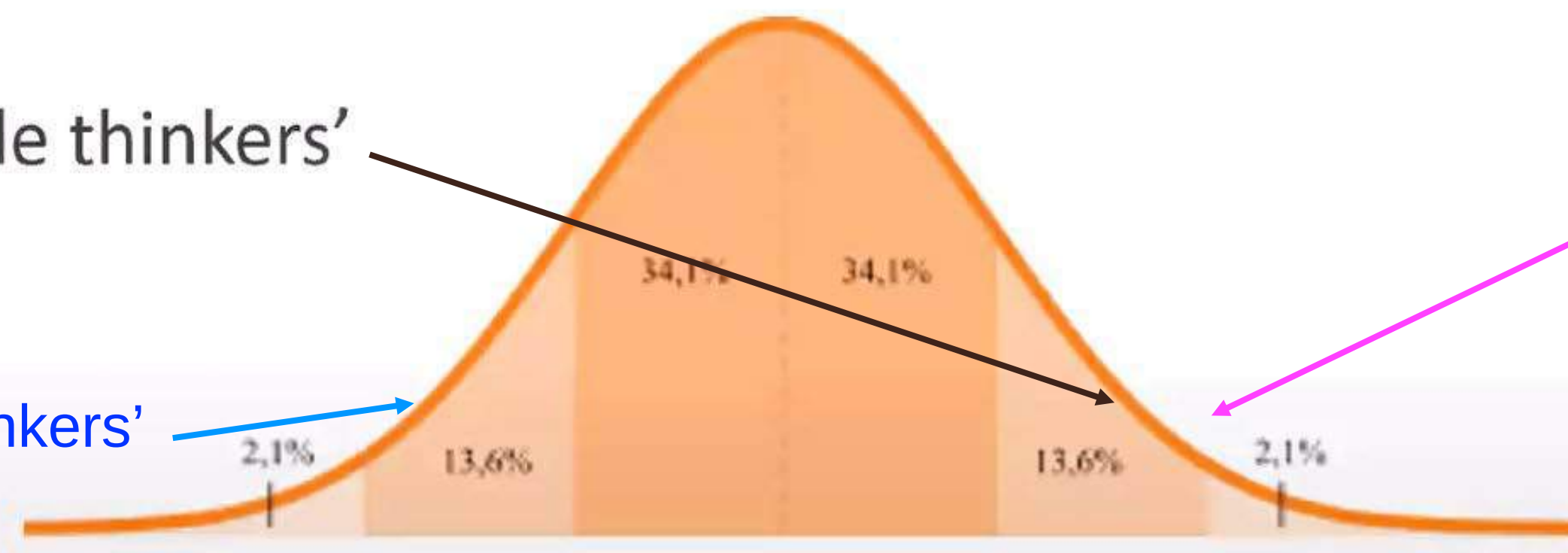
“The Provider”

EVOLUTION - MOTHER NATURE IN 21C:-

Evolution (1/2)

- No clear-cut boundaries between women & men
- A normal distribution along Gauss curves
- Extreme “male thinking”
- Many women are more ‘male thinkers’ than many men...

...& some men are more ‘female thinkers’ than some women...



**Social Revolution
21st Century?**

...& gender identity...

Swanepoel, A. (2024)

Prevalence

Global prevalence in youths: **5.9%**;

Australia: 6-10% (Graetz et al, 2001; Lawrence et al, 2015)

Little evidence for increase in the '**ADHD phenotype**' (i.e. extreme ADHD traits); but increase in **clinically diagnosed ADHD** likely due to better reporting and better awareness (Rydell et al, 2018). **BUT** - it is persistent in the gene pool and is subject to evolutionary pressures (Esteller-Cucala, P. *et al.* 2020., Williams J, Taylor E. 2006)...so watch this space!!!!!!

Global prevalence in adults: **2.5%** (Faraone et al, 2021)

Persistence of functional impairment / symptoms into adulthood is high ~40% - 60% (Faraone et al, 2006). *Does treatment in childhood affect persistence and prevalence in adulthood?*

Sex

Children and Youths: male - female ratio **2:1** (large-scale meta-analysis of 40-50K participants: Willcutt et al, 2012)

Adults: male - female ratio close to **1:1** **Why?...and So What?**

Epidemiology

ADHD is not a “Thing”

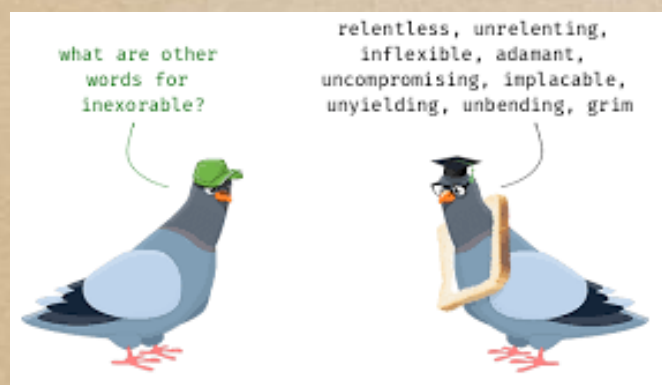
Unlike a dose of COVID or a broken bone (& yes, I know they have comorbidities), ADHD is not in itself a “Thing”.

Both the expression of the underlying cause(s) AND co-morbid conditions, vary from person to person.

This reflects an inexorable equation of Nature...



$$\begin{array}{ccccc}
 \textit{Genetics} & \times & \textit{Environment} & = & \textit{Who \& What we are (\& how we behave)} \\
 (\& Epigenetics) & & (\textit{Internal \& External}) & & (\textit{Physically \& Mentally})
 \end{array}$$



This inexorable equation underlies the Bio-Psycho-Social model of Health (or everything), in which:

Bio: the Genetic & Evolutionary Imperatives of Adaptation & Survival; shaped by epigenetic influences of, for example, maternal or paternal traumas. It encompasses maternal & paternal influences pre-conception, in conception, the intrauterine environment, and the post-partum physical environment.

Psycho-Social describes the external mental environment, itself a reflection of the social environment, and the internal mental environment, also shaped by the social environment, in the developing child...& then in the adolescent and adult.

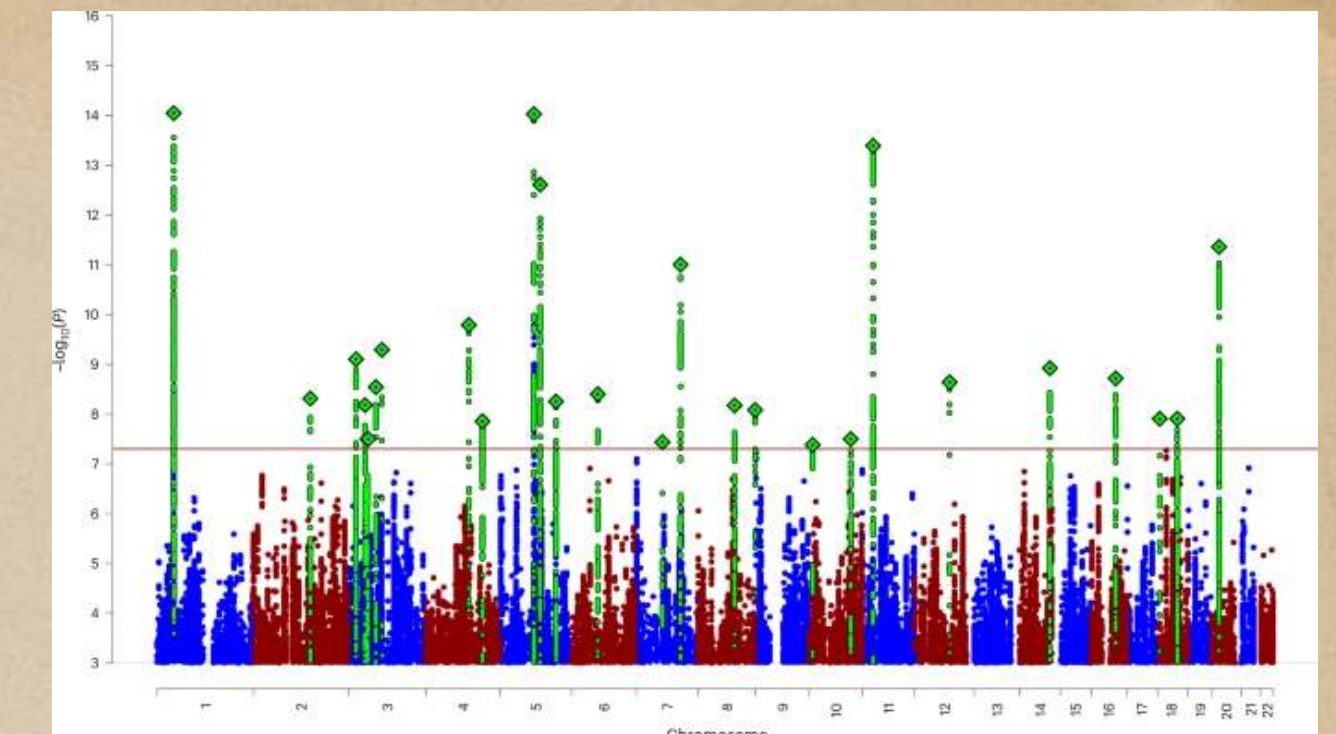


Inexorable

MY thoughts hold mortal strife;
I do detest my life,
And with lamenting cries
Peace to my soul to bring
Oft call that prince which here doth monarchise:
--But he, grim-grinning King,
Who caitiffs scorns, and doth the blest surprise,
Late having deck'd with beauty's rose his tomb,
Disdains to crop a weed, and will not come.

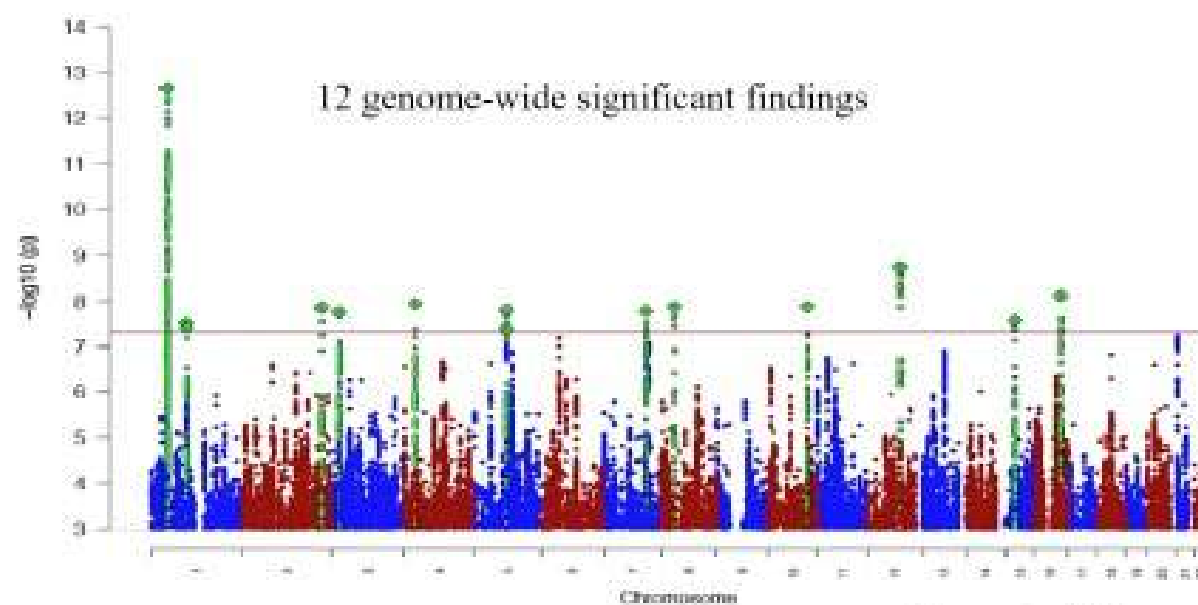
William Henry Drummond

ADHD Aetiology: Bio-psycho-social



GWAS meta-analysis for ADHD

PGC : 11 ADHD samples: 5,999 cases, 12,699 controls
iPSCH : 14,584 cases, 22,492 controls



Demontis, Walters, et al, Nature Genetics 2019

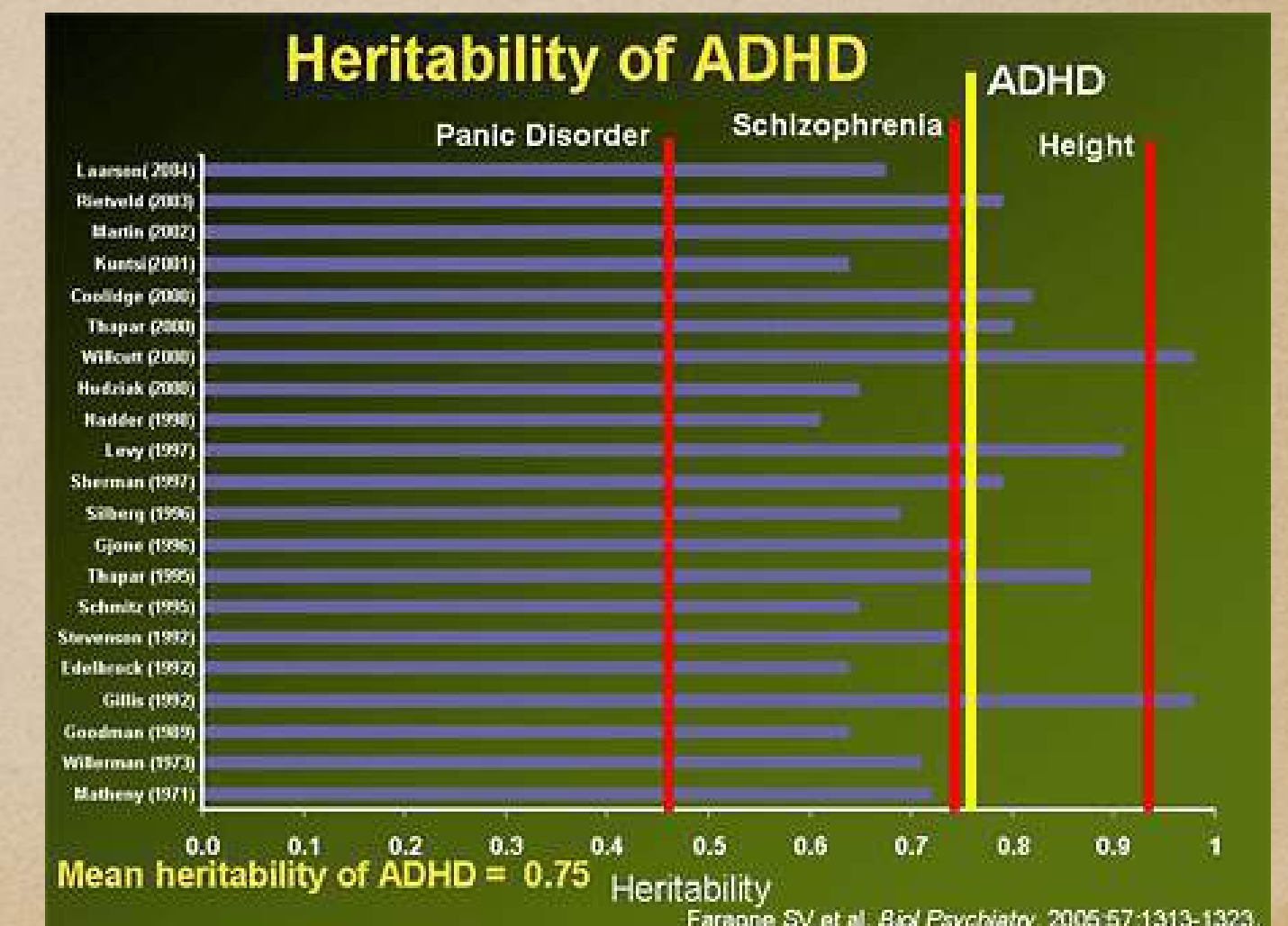


✦Familiality:

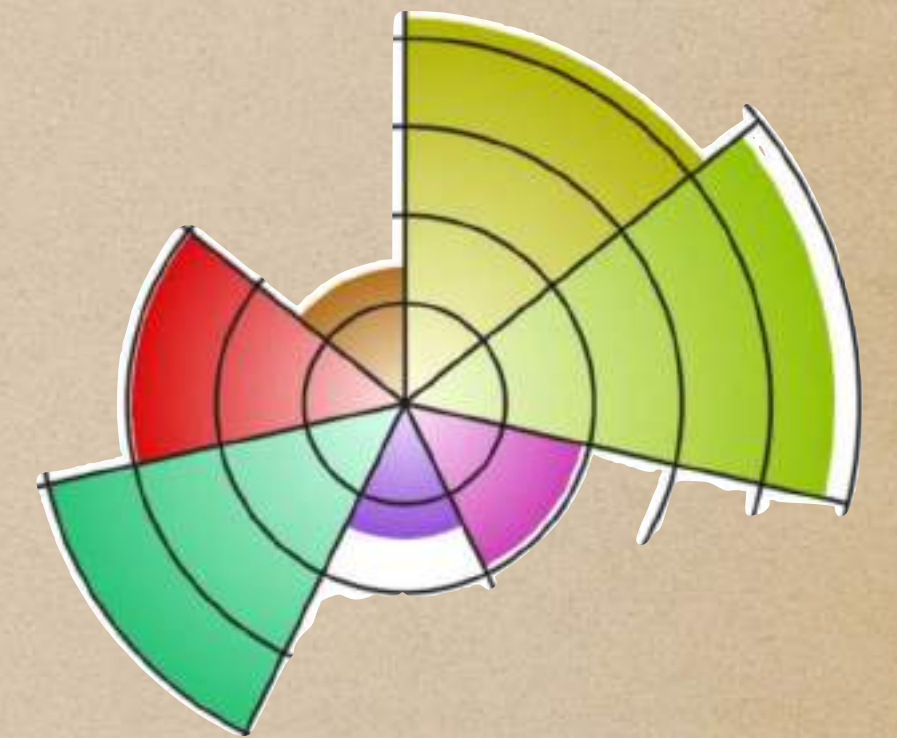
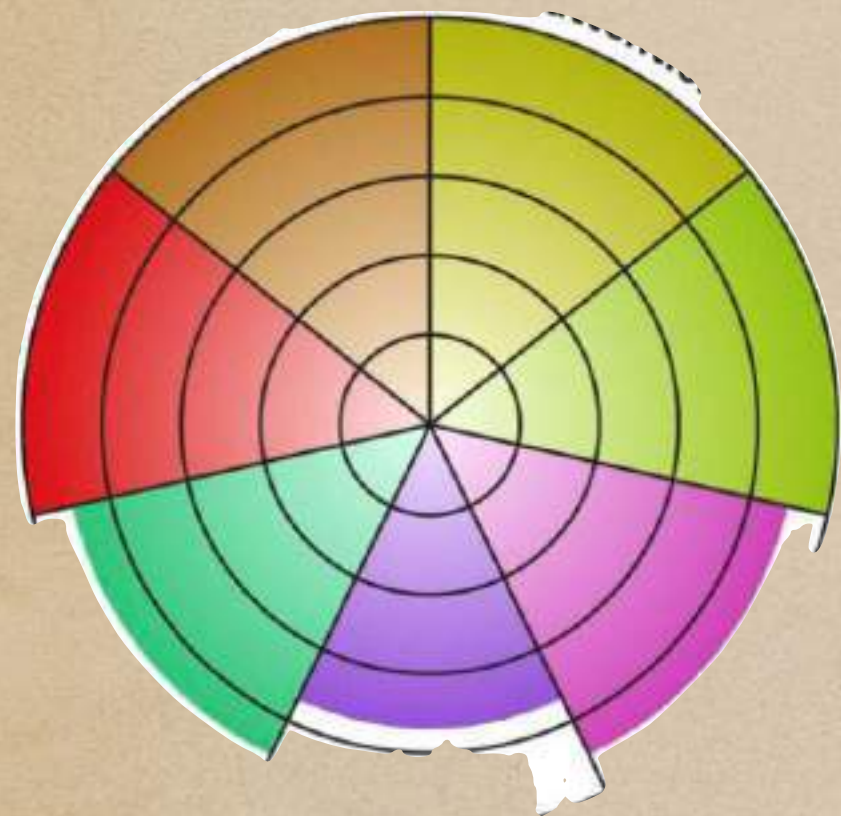
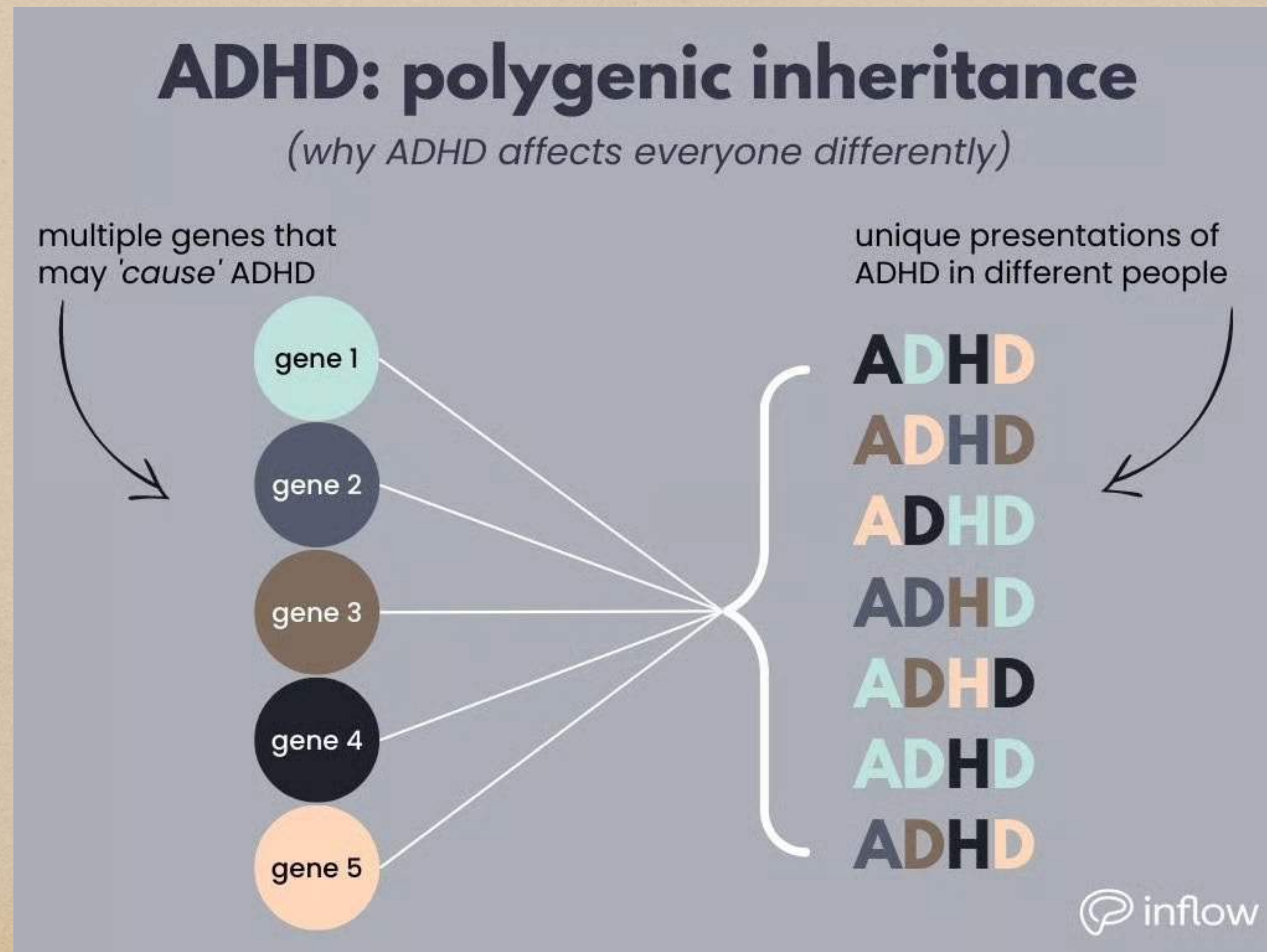
- more prevalent among biological relatives of an affected individual
- 5-10 fold increase in risk in parents and siblings of children with ADHD (Biederman et al, 1990; 1992)

✦Heritability:

- whether it is defined categorically or dimensionally, heritability of ADHD is high (70-90%) (Levy et al, 1997)



Pleiotropy... *(and wait 'til you see Jane!)*

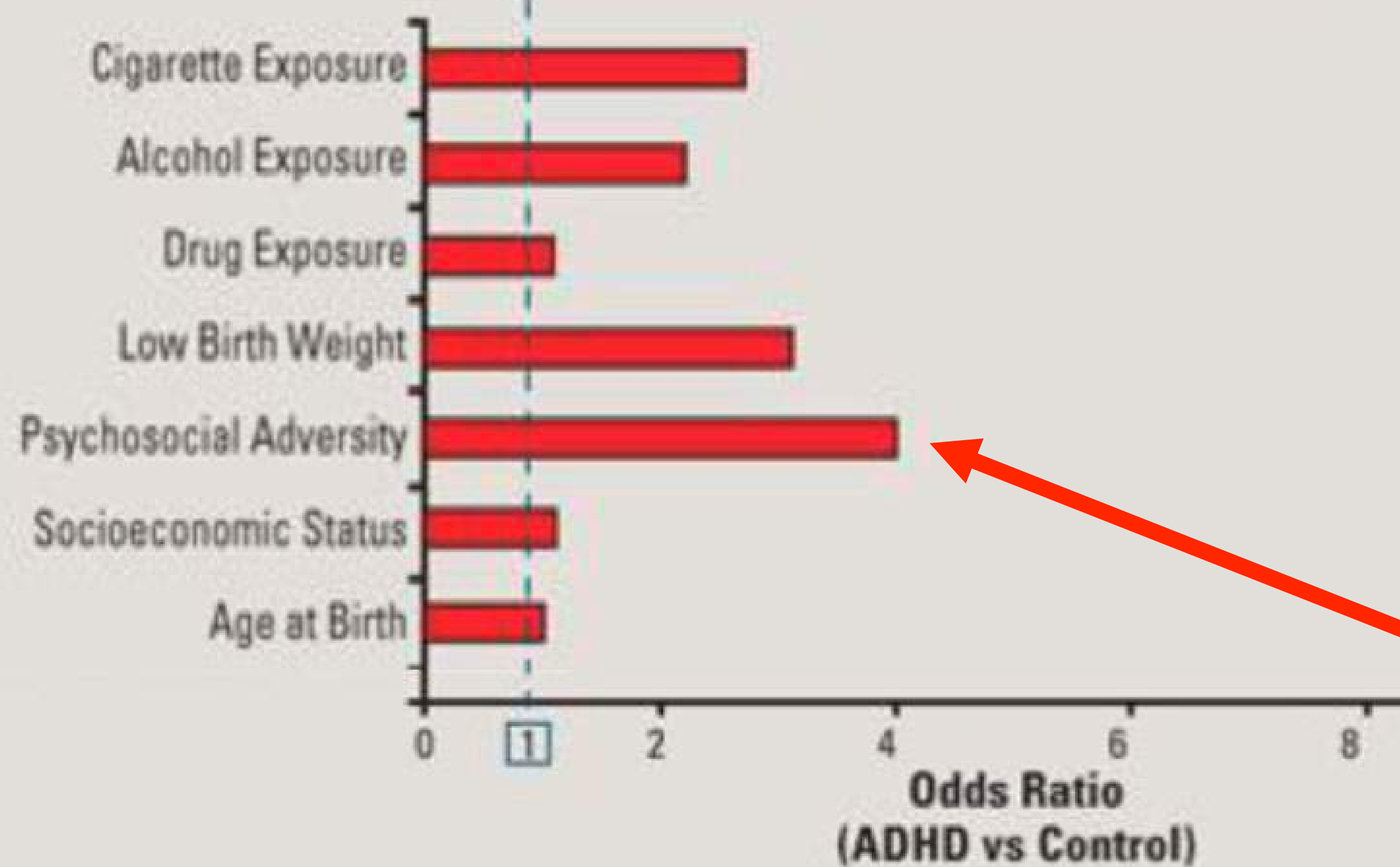


Koller et al 2024, Demontis et al Nature Genetics, 2023,

Environment - Pre-conception & Perinatal

Pre- and Perinatal Risk Factors for ADHD

Results from Logistic Regression Model



Increased Risk:- ICS Statement 2021 (Faraone et al, 2021)

- Increased blood levels of lead in ADHD
- Artificial food additives- very small increase in risk
- Maternal use of acetaminophen (Para. 38)
- Prenatal exposure to sodium valproate
- Children of mothers with high levels of phthalate X3 risk for ADHD

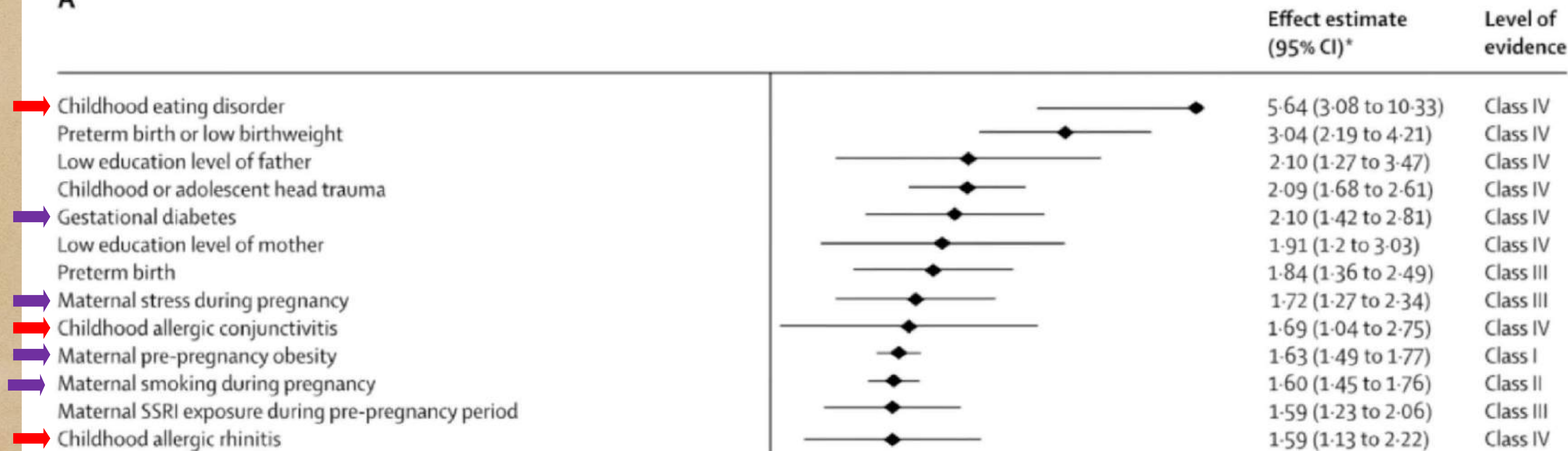
(But see Ahlqvist et al 2024 re acetaminophen)

Kanina 2023
Gómez-Cano 2021
Palacio-Ortiz 2024
Guedria A 2025



Environmental risk for ADHD

A

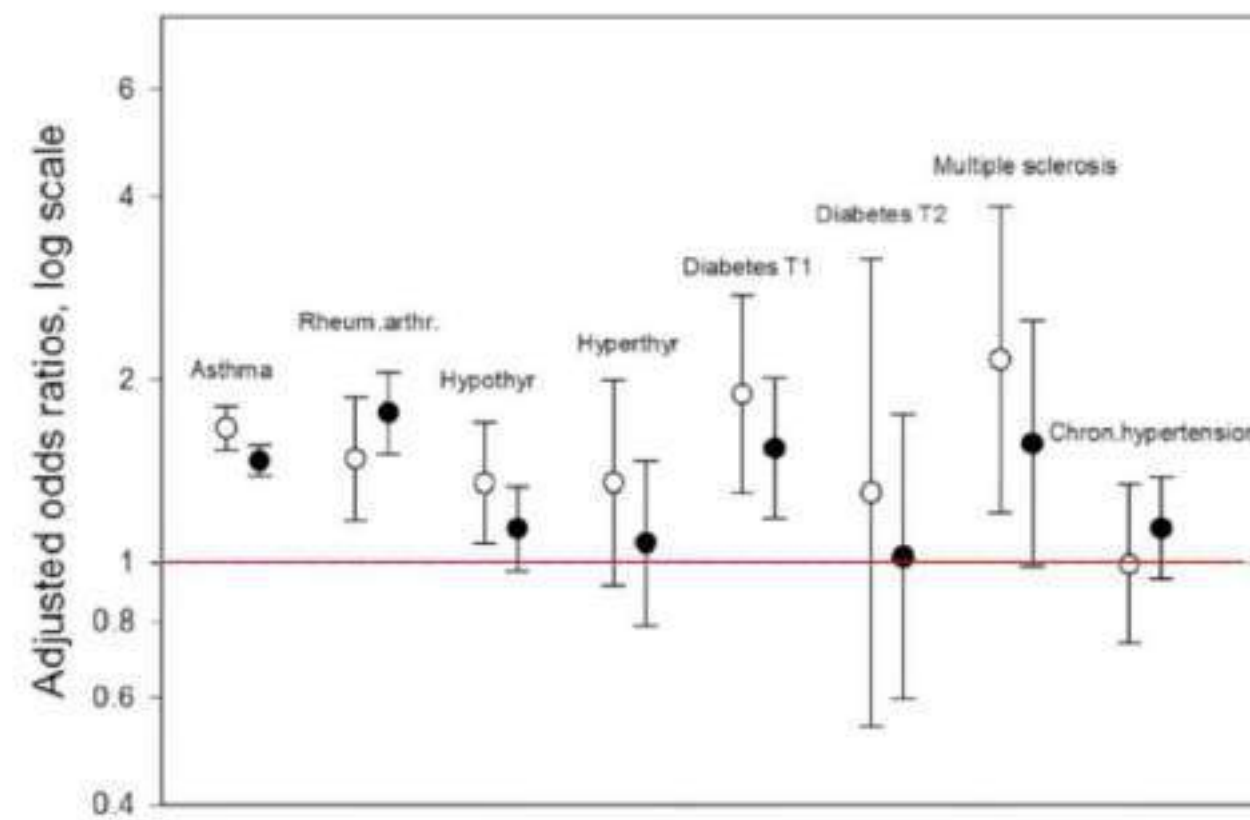


Kim*, Kim*, et al. **Lancet Psychiat** 2020

Inflammation

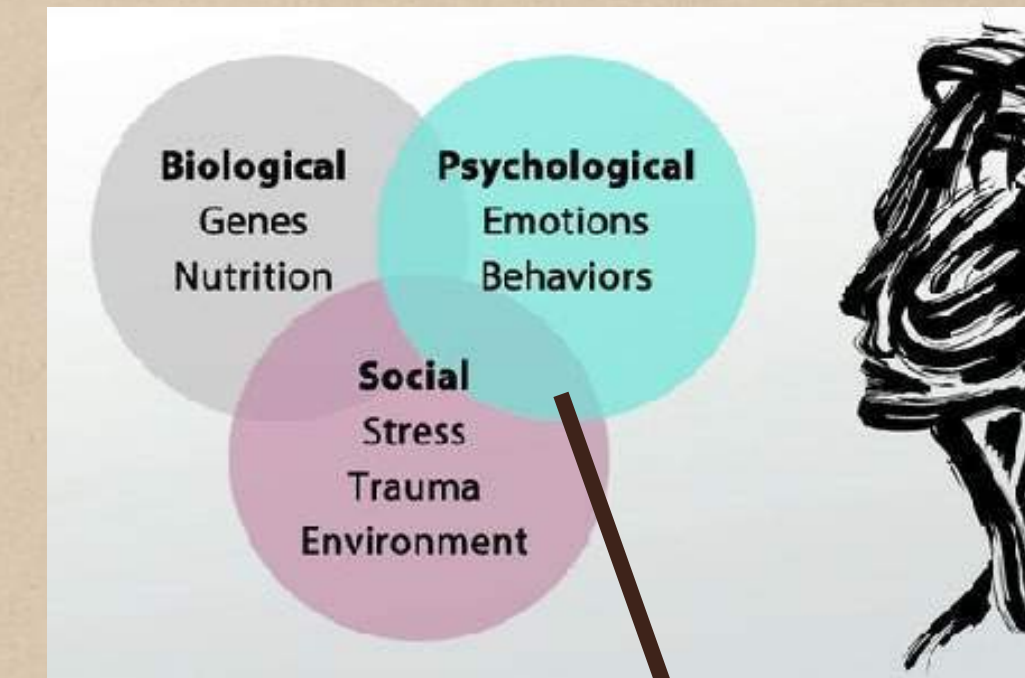
Maternal chronic inflammatory disease & offspring ADHD.

Offspring of mothers with rheumatoid arthritis or asthma:
20-80% increased risk of ADHD (N = 47,944/ 2,274,713)

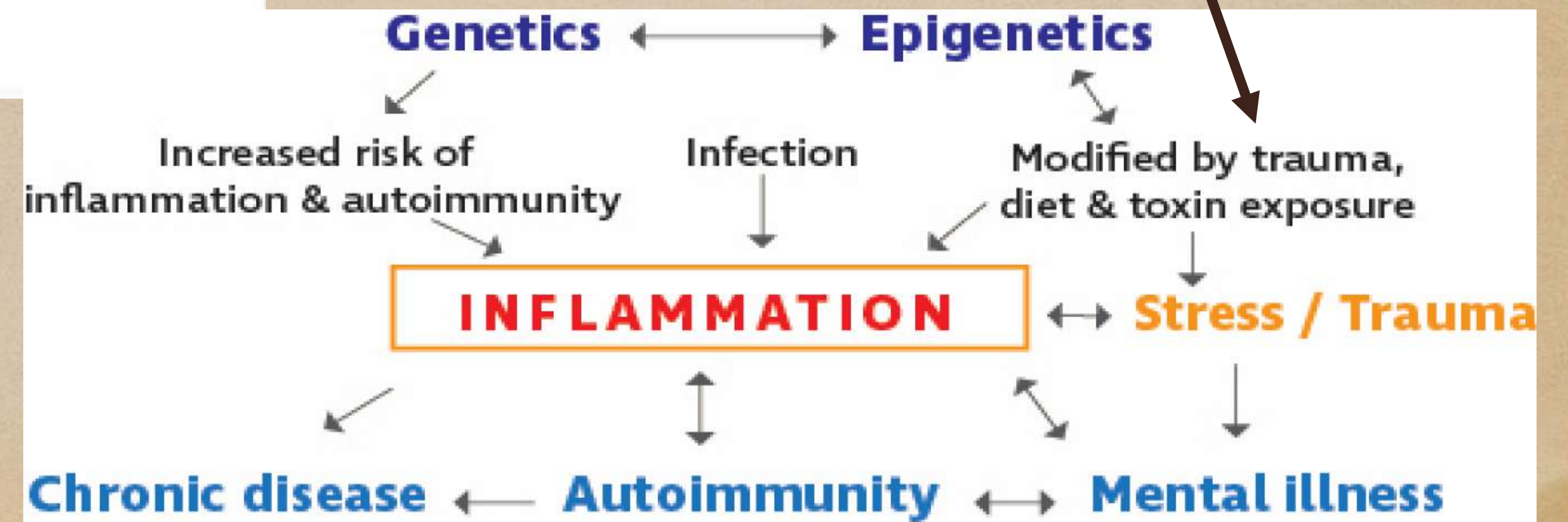


Associations between
maternal diseases and
ADHD patients by sex.
Female ADHD group
(black), male ADHD
group (white). Norway,
1967-2012.

Attention-deficit/hyperactivity disorder in offspring of mothers with inflammatory and immune system diseases. Instanes et al. Biological Psychiatry 2015



Psycho-social adversity



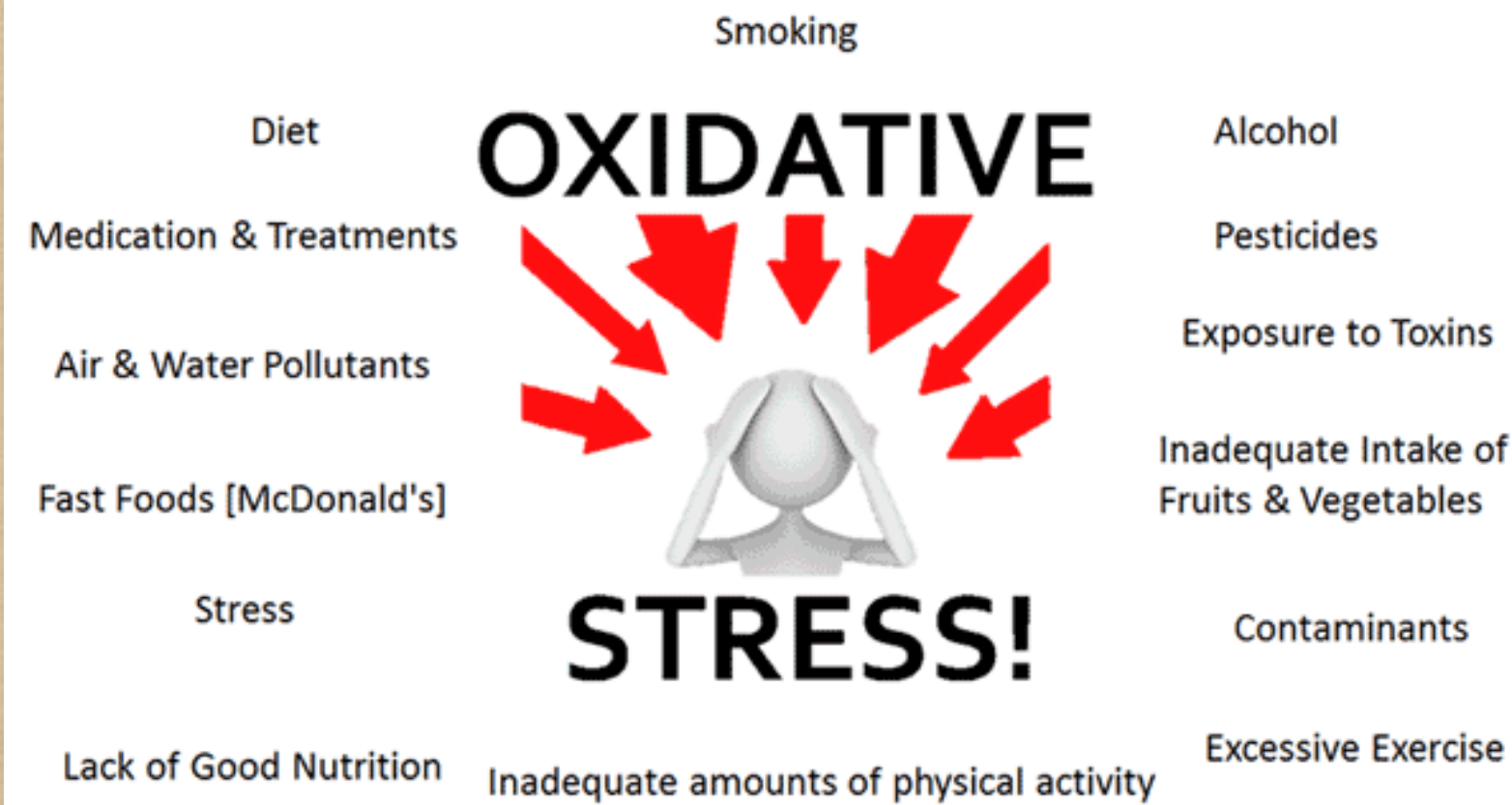
WHY? - Back to Genetic Pleiotropy

GWAS data shows extensive pleiotropy of genes for medical disorders & ADHD: **eg** SUDs - including smoking (Keller et al 2024), Obesity (Dements et al 2023), and Sleep Apnoea (Tong, Chen, Chi 2025 & **oxidative stress** - Mastino et al 2023)

Importantly GWAS data coalesces around co-occurrence of ADHD with disorders of immune function, including: elevated CRP (but see above - smoking), Rheumatoid Arthritis, Psoriasis (Tylee et al 2018), Pain Syndromes (Ciochetti et al 2025), Type 2 Diabetes (Barabnova et al 2023) and **Thyroid Function** (Albrecht et al 2020) - **WARNING!**

A Bidirectional relationship appears to exist between ADHD and **Immune Function** (Jue et al 2024)

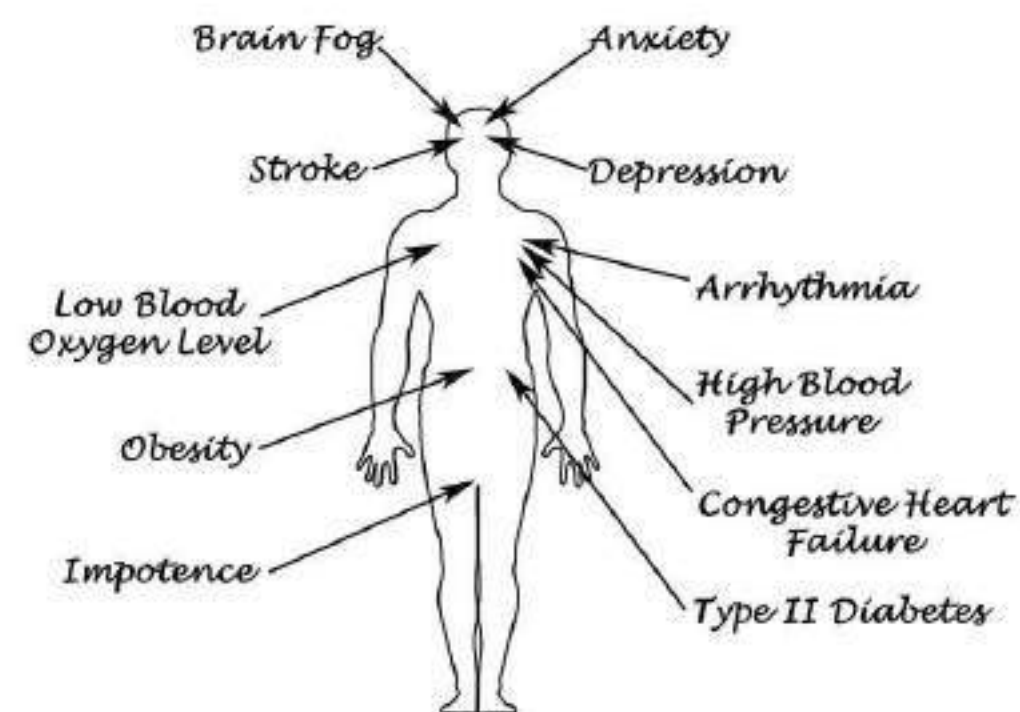
Causes of Oxidative Stress



Just about everything we do results in oxidation (or inflammation) producing potentially damaging free radicals!

Mastino et al 2023

SLEEP APNEA SYMPTOMS



Chandimal et al 2025

Oxidative Stress

Pizzino et al 2017

Signs and Symptoms of Oxidative Stress



- Fatigue and Low Energy Levels
- Mental Cloudiness and Cognitive Challenges
- Premature Ageing
- Mood Imbalances
- Inflammation and Joint Discomfort
- Weakened Immune Response
- Metabolic Dysfunction

www.sprintmedical.in

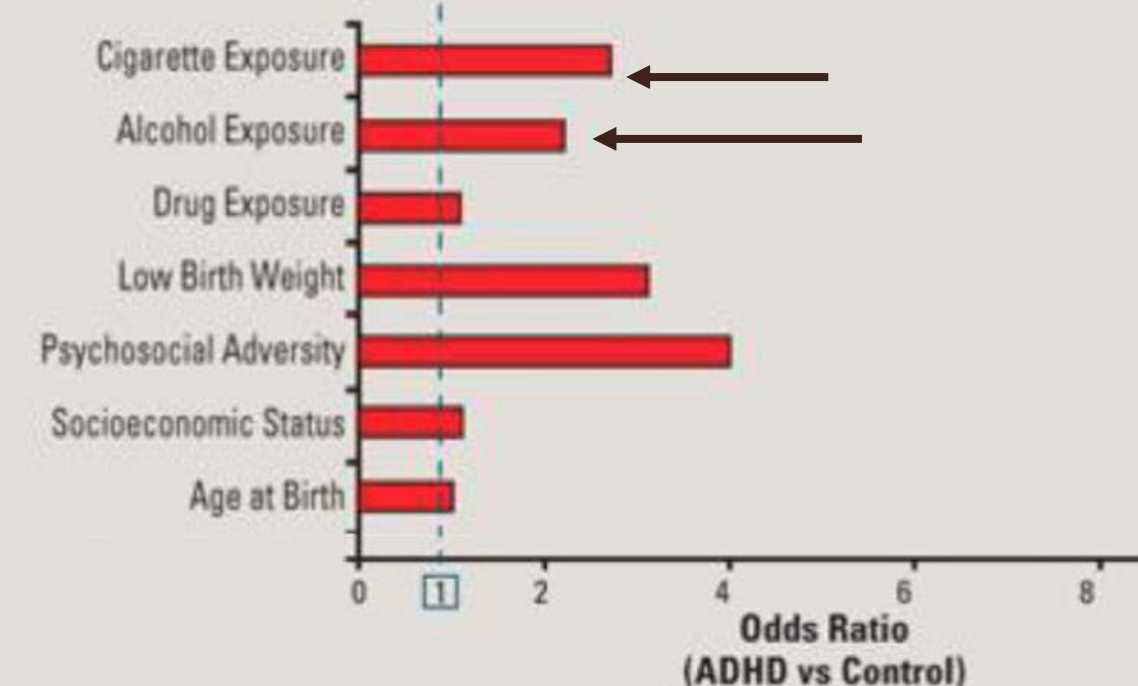
How Can I Reduce Oxidative Stress Fast?

1. Engage In Regular Physical Activity
2. Manage Stress Effectively
3. Get Enough Sleep
4. Avoid Smoking & Excessive Alcohol Consumption
5. Reduce Exposure To Environmental Toxins
6. Eat An Antioxidant-Rich Diet
7. Incorporate Omega-3 Fatty Acids
8. Limit Processed Foods & Sugar
9. Stay Hydrated
10. Include Polyphenol-Rich Foods

Sharifi-Rad et al 2020

Pre- and Perinatal Risk Factors for ADHD

Results from Logistic Regression Model



Random References - 1st Quarter 21st Century

Brown, A.A. et al. Associations of the **gut microbiome and inflammatory markers** with mental health symptoms: a cross-sectional study on Danish adolescents. *Sci Rep* 15, 10378 (2025). <https://doi.org/10.1038/s41598-025-94687-7>

Lewis, Villani, & Lagopoulos, **Gut dysbiosis** as a driver of **neuroinflammation** in attention-deficit/hyperactivity disorder: A review of current evidence, *Neuroscience*, Volume 569, 2025, Pages 298-321, ISSN 0306-4522,

Schnorr, I. et al. **Inflammatory** biotype of ADHD is linked to **chronic stress**: a data-driven analysis of the inflammatory proteome. *Transl Psychiatry* 14, 37 (2024). <https://doi.org/10.1038/s41398-023-02729-3>

Wong, R.S.Y. **Psychopathology** of attention deficit/hyperactivity disorder: from an **inflammatory** perspective. *Egypt J Neurol Psychiatry Neurosurg* 58, 123 (2022). <https://doi.org/10.1186/s41983-022-00561-y>



Jane: a Genetically Driven Diagnostic Puzzle

27yo Office Manager - married with no children



Her Psychologist identified substantially masked Autism traits and felt an ADHD assessment was warranted: Jane described a background of lifelong attribution to anxiety, rather than neurodivergence...by everyone!

Genetic Background: Paternal emotional dysregulation, impulsivity, substance abuse; **Maternal** hoarding behaviours, prescription drug abuse and suspected ADHD & Autism.

GP Medical work-up: obesity & non-alcoholic fatty liver, insulin resistance, acne, hirsutism, gallstones, possible lactose intolerance (coeliac excluded).

Bloods showed chronic low iron and Vitamin D, with elevated CRP and high ferritin.

Menstrual cycle irregularities noted.



Jane: On First Assessment



ADHD: met criteria for an independent diagnosis of ADHD Combined Type, with associated **anxiety** and **emotional dysregulation**.

Menstrual cycle explored: significant irritability and emotional triggering, impaired sleep and increased anxiety in the premenstrual period, with significant acne which subsided in the ovulatory stage.

Significant menstrual irregularities, normalised by Oral Contraceptive Pill but becoming irregular on ceasing. Ultrasound scanning did not reveal any ovarian cysts (**BUT!**).

Sought **Nutritionist guidance** for diet, commenced exercise - reduced anxiety & more regular cycles, but very long up to 50 days, becoming shorter over time.



First Assessment continued



Why face-to-face matters in first assessment: very soft, baby-like, appearance to her skin, which proved to be very elastic. Gesticulation suggested joint hypermobility & this was evident across at least three joints (she could touch her elbows to the floor from standing), and she recalled ankle joints “popping” often in Netball.

IBS: no obvious cause, though highly anxious & likely lactose intolerant... but see above!

Intermittent pelvic pain with endometriosis and fibroids excluded, and “cramping” post coitus and, in particular, post orgasm. Not related to vaginal dryness, she had not noted a relationship to her cycle... again, see above!

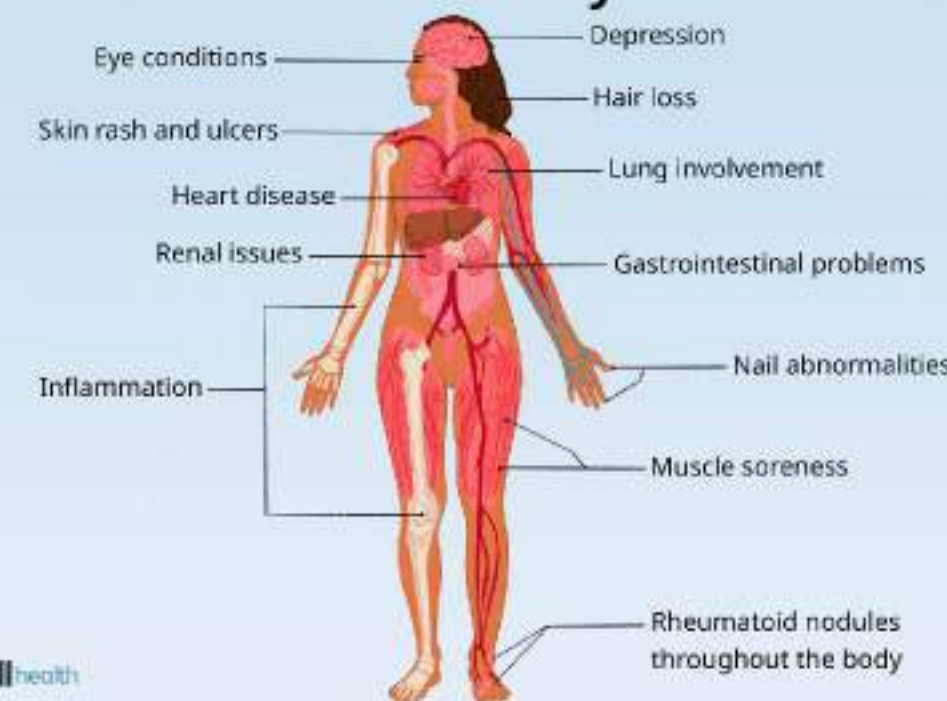


COMPONENTS OF HEDS & HSD

© Debra Huxley and Beth Jones

A diagram of a human body with lines connecting various health conditions to different parts of the body. The conditions are listed in colored ovals around the body:

- HEADACHE (top left)
- JOINT HYPERMOBILITY (top right)
- DYSAUTONOMIA / POTS (middle right)
- POOR WOUND HEALING (lower middle right)
- ARTHRITIS (bottom right)
- SPINAL INSTABILITY (bottom right, below arthritis)
- PELVIC PROLAPSE (bottom right, below spinal instability)
- IBS (bottom center)
- INFLAMMATION (bottom left)
- CRPS (middle left)
- JOINT SUBLUXATION (middle left)
- NERVE COMPRESSION (middle left)
- MCAS (top left)



Types of Psoriasis

The diagram illustrates seven types of psoriasis, each shown in a circular inset with a corresponding label below it:

- Plaque:** A circular inset showing a cluster of raised, red, scaly patches on a brown background.
- Guttate:** A circular inset showing several small, red, scaly patches on a light pink background.
- Inverse:** A circular inset showing a dark, brown, scaly patch on a dark brown background.
- Erythrodermic:** A circular inset showing a large, red, scaly patch on a light pink background.
- Nail:** A circular inset showing a close-up of a nail with a yellowish, scaly patch.
- Pustular:** A circular inset showing several small, red, scaly patches with white centers on a light pink background.
- Scalp:** A circular inset showing a close-up of a person's head with red, scaly patches on the scalp.

[illegible]



TYPES OF PCOS

ADRENAL PCOS

symptoms	causes
Excess hair growth, acne, irregular periods 	High levels of androgens from adrenal gland

INSULIN-RESISTANT PCOS

symptoms	causes
Weight gain, hair loss, acne, irregular periods 	Insulin resistance, leading to high levels of insulin 

INFLAMMATORY PCOS

symptoms	causes
Acne, hair loss, weight gain, irregular periods 	Inflammation in the body, leading to insulin resistance 

PILL-INDUCED PCOS

symptoms	causes
Inflammation in the body, leading to insulin resistance	Stopping birth control pills 

medhyaherbale.com

Endocrine System



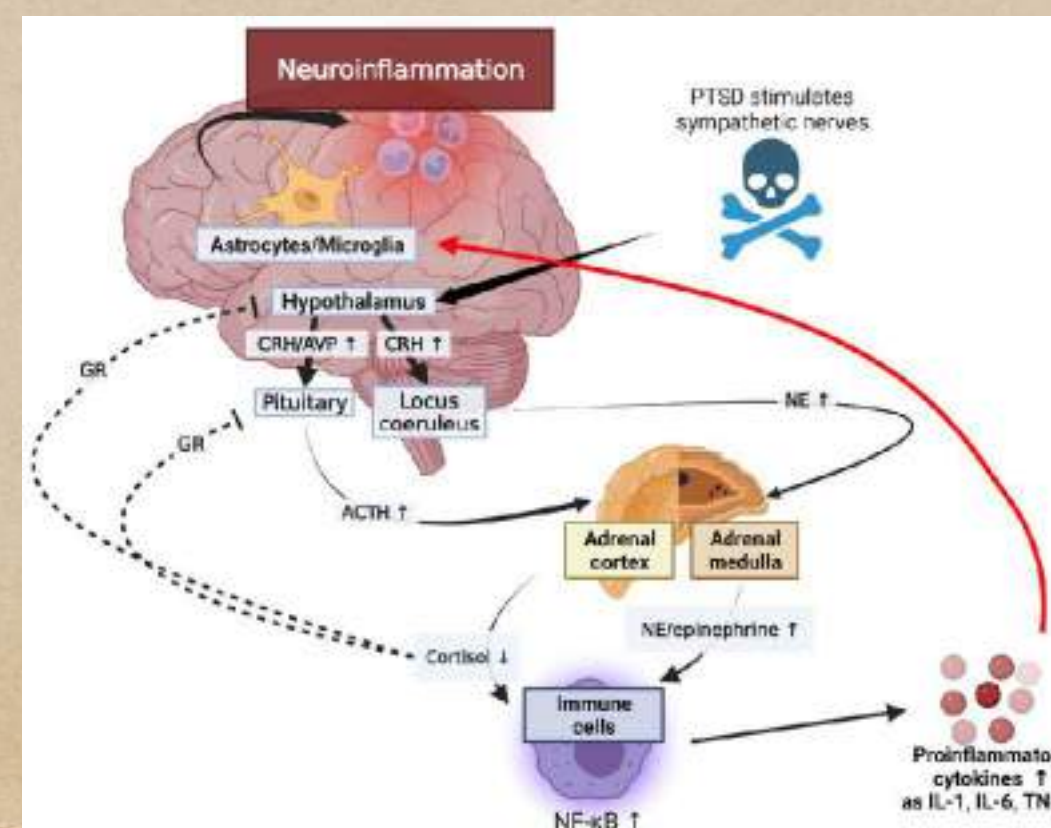
Kooij et al 2025

ADHD

Symptoms of Thyroid Problems in Females

- Fatigue
- Increased Heart Rate
- Sensitivity to Heat
- Excessive Weight Loss
- Sensitivity to Cold
- Slow Heart Rate
- Excessive Weight Gain
- Tiredness

Credihealth



Immune System

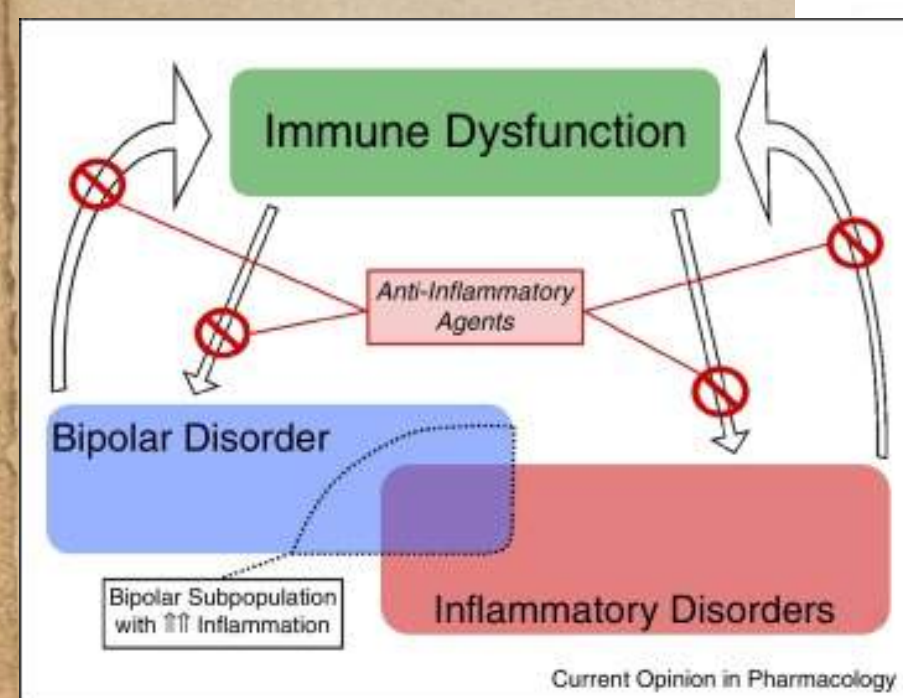
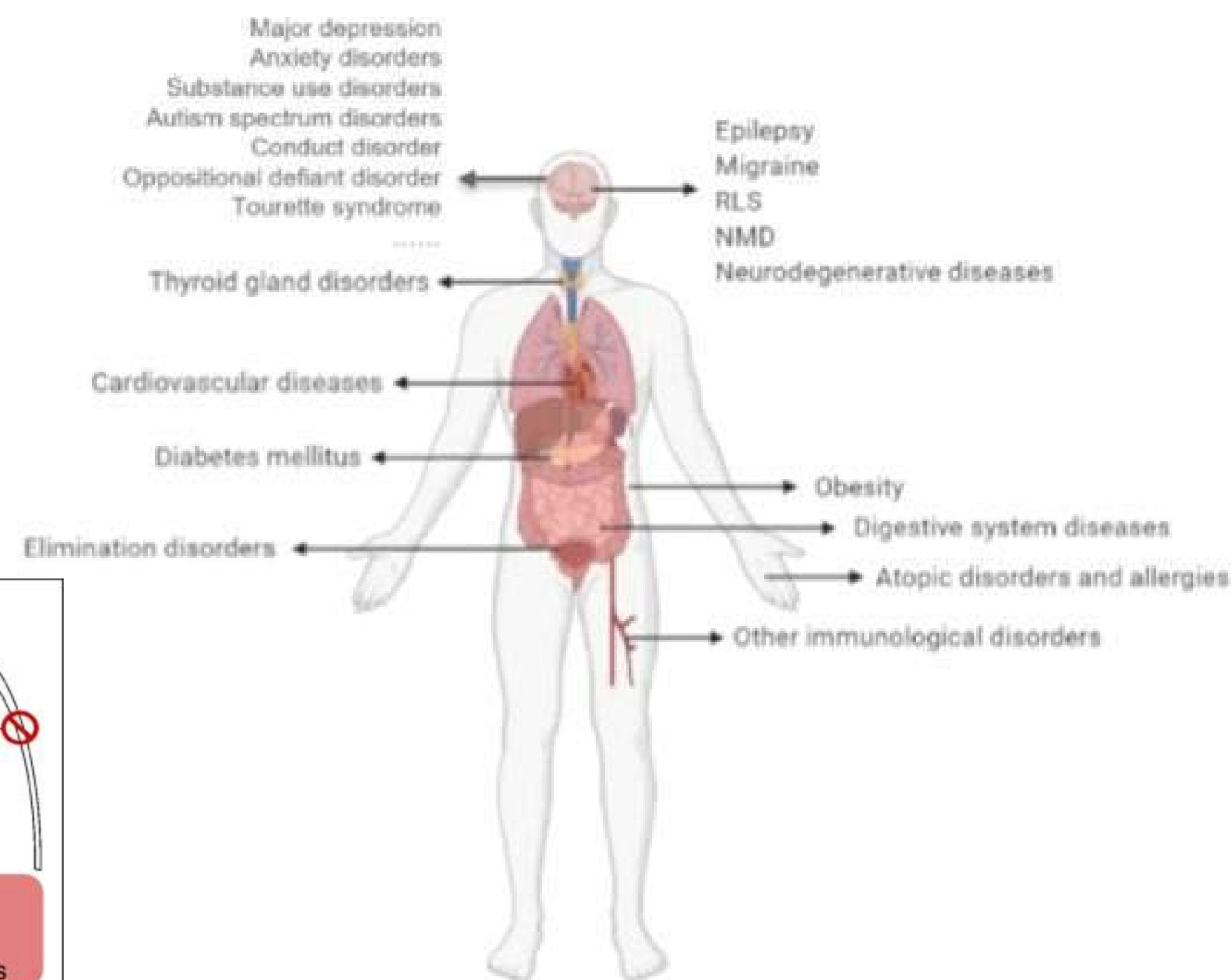
WHAT ARE SOME OF THE POTENTIAL side effects and reactions LISTED ON BIRTH CONTROL INSERTS?

- 
- Risk of developing blood clots
 - Cancer of the reproductive organs and breasts
 - Change in appetite
 - Gallbladder disease
 - Mental depression
 - Irregular vaginal bleeding
 - Gastrointestinal Symptoms
 - Pre-menstrual syndrome
 - Liver tumors
 - Nausea
 - Melasma
 - Headache
 - Dizziness
 - Rash
 - Weight gain
 - Acne
 - Heart attacks and strokes
 - Vaginal infections
 - Changes in vision
 - Nervousness
 - Loss of scalp hair
 - Allergic reactions
 - Vaginal candidiasis
 - Changes in libido

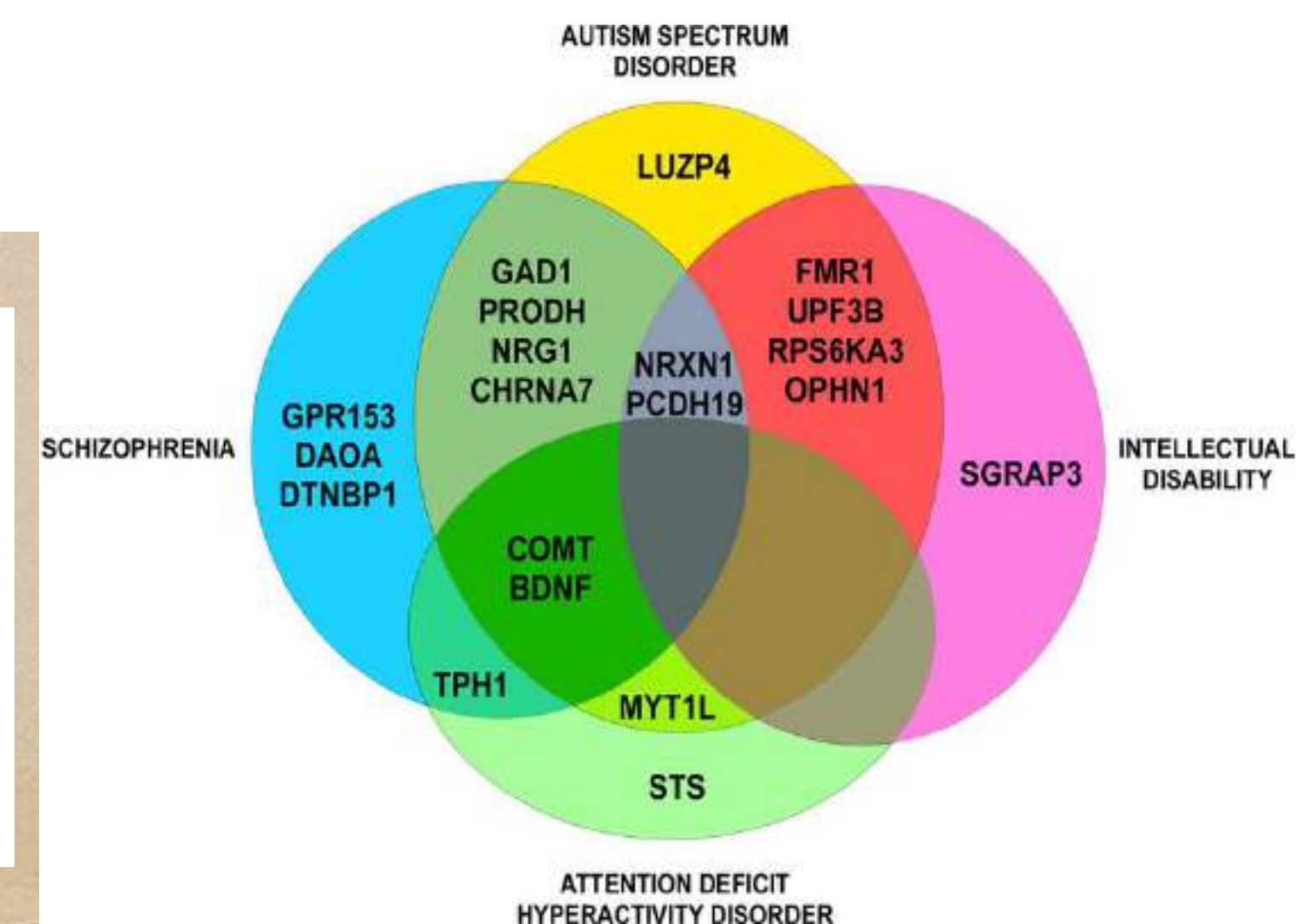
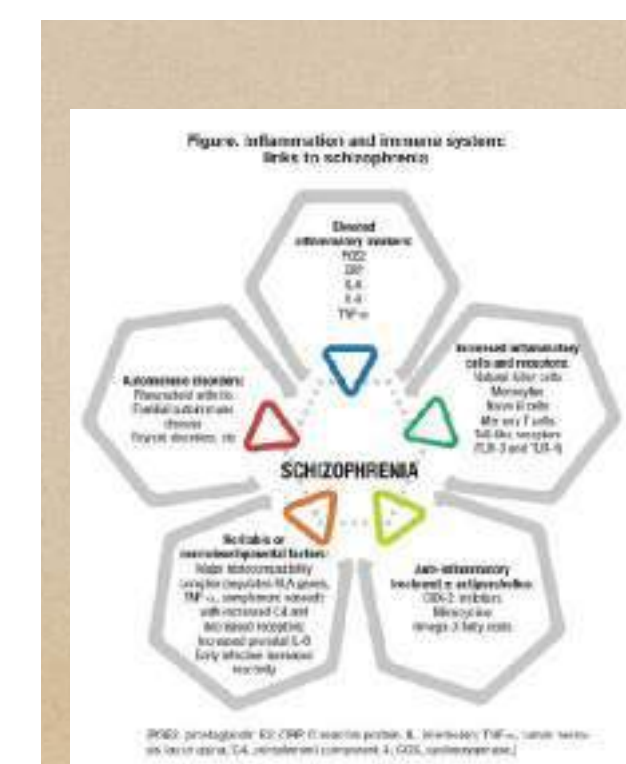
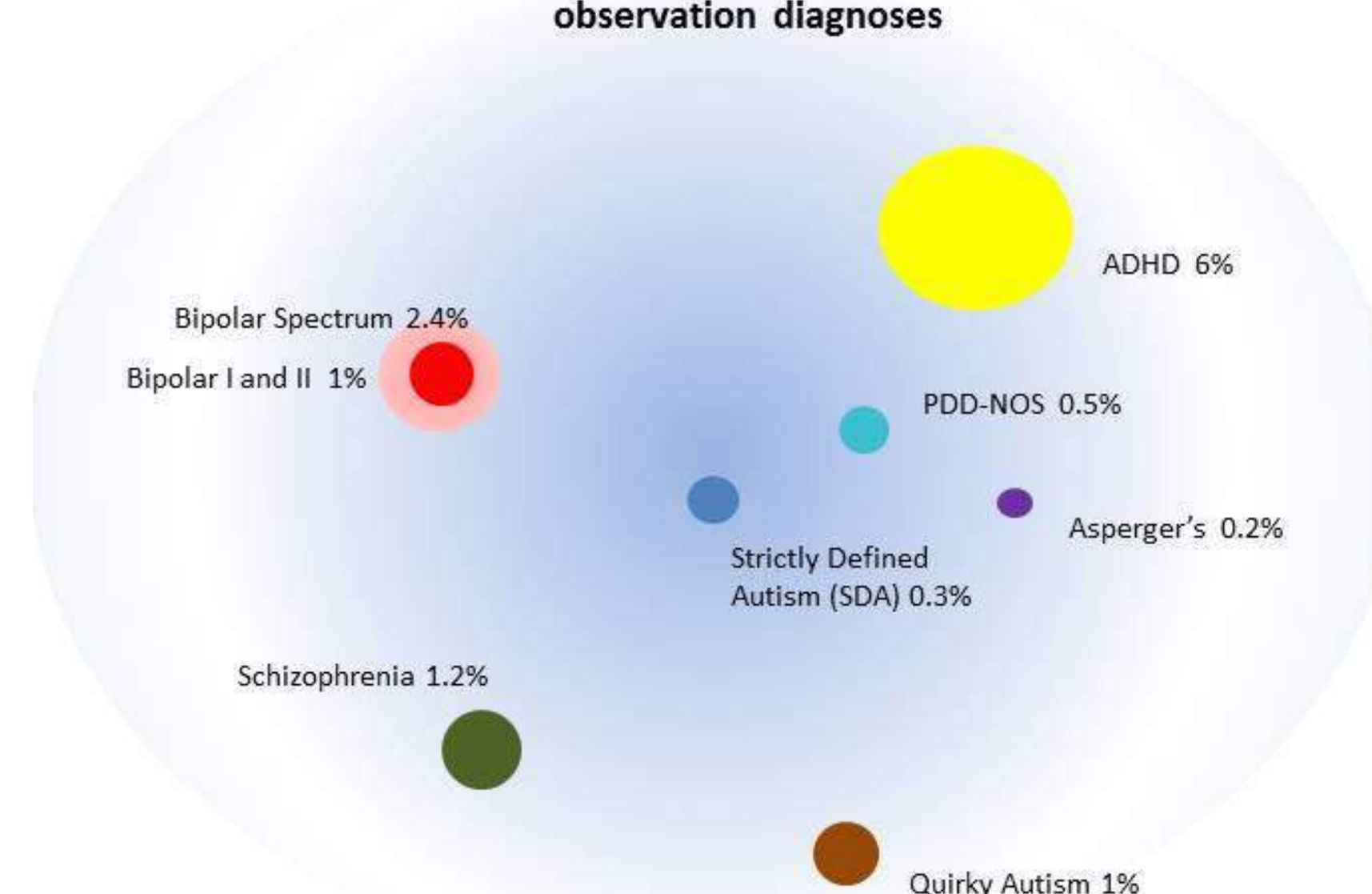


...and also...

Comorbidity in ADHD



Autism at the centre of a cloud of genetically-related observation diagnoses

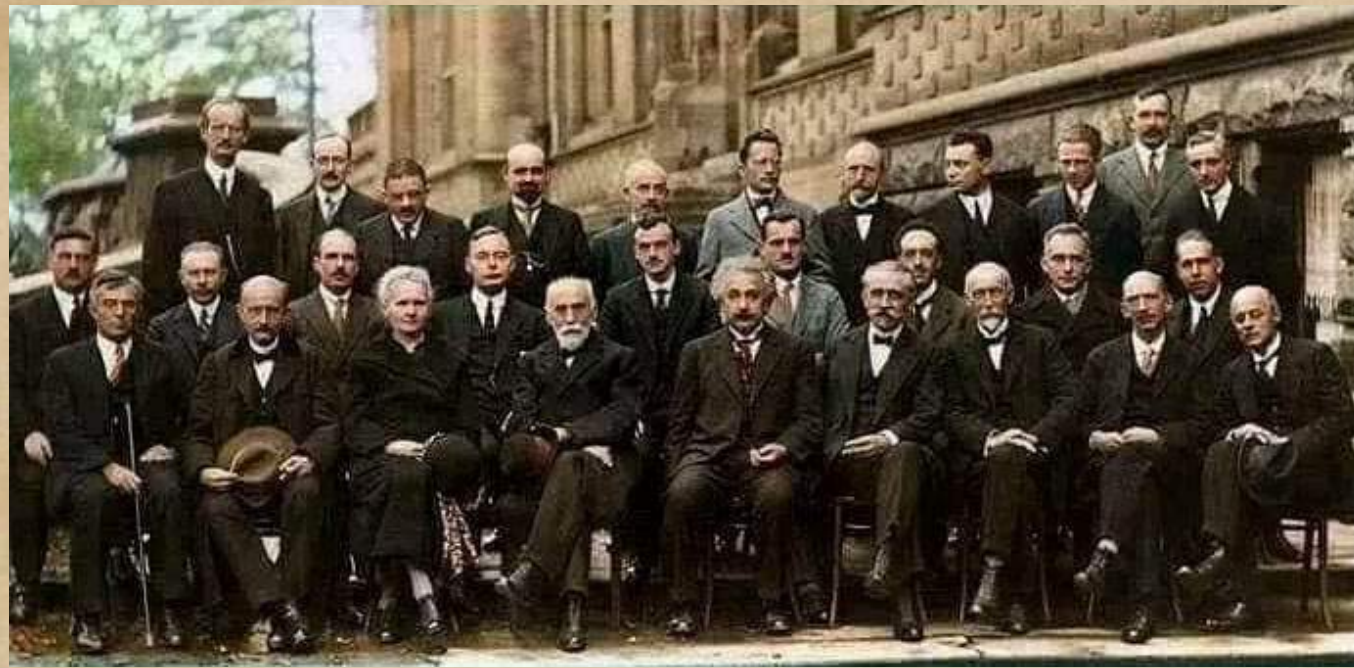




“Adults: male - female ratio close to 1:1 Why?...and So What?”

Why are females not recognised earlier????????????





Solvay Conference 1927

An Evolutionary View of Diagnostic Blindness:

The SCARF Model

...& “The Social Glue”

- Relatedness - the social group(s)
- Status - within the social group(s)
- Certainty - predicting my world
- Autonomy - in control of my world
- Fairness



Rock 2008,
Bedrov & Gable 2023

(NOT) Recognising & Diagnosing the Female Sparkle Brain in Childhood

- Females **tend** to **exhibit** inattentive type behaviours rather than disruptive hyperactivity like those horrible boys, **hence less noticed**; also...
- Behavioural **expectations & interpretations** by parents & teachers - the “daydreamer”, “chatty girl”, “Dramatic” - considered **“acceptable” behaviours or “character traits”** (Carbonneau et al 2021)
- **Socialised into internalising** problem behaviours, - with low self esteem, anxiety & depression, instead of externalising behaviours - with aggressiveness, defiance, delinquency
(Gutman & McMaster 2020, Liu et al 2011.) **... remember SCARF, and so...**



- **“Masking”** of “unacceptable” behaviours to ensure social acceptance within their peer group (hence confusing friends, teachers & parents alike) (Quinn & Madhoo 2014)
- ...give rise to **under-recognition** and **under referral** & hence **under-diagnosis**
(Young et al 2020, Skogli et al 2013)
- A common example of under-recognition is in **“hyperactivity”**: some hyperactive girls often **internalise & mask** with fiddling, or doodling, or chatting.
- In adulthood it is an inner restlessness, an urge always to “do something”.
- A 39yo woman laughingly described clenching her buttocks to hide her hyperactive drive! She commented they got very sore!





Consequences: Anxiety & Emotional Dysregulation



- Not willing to take risks and easily discouraged
- **Shy**
- **Self-blaming**
- **Anxious** and depressed
- **Anxiety** around school performance



- Immature (as perceived by others)
- **Unable to read other's cues**
- **May not have friends**
- **Difficulty fitting in**



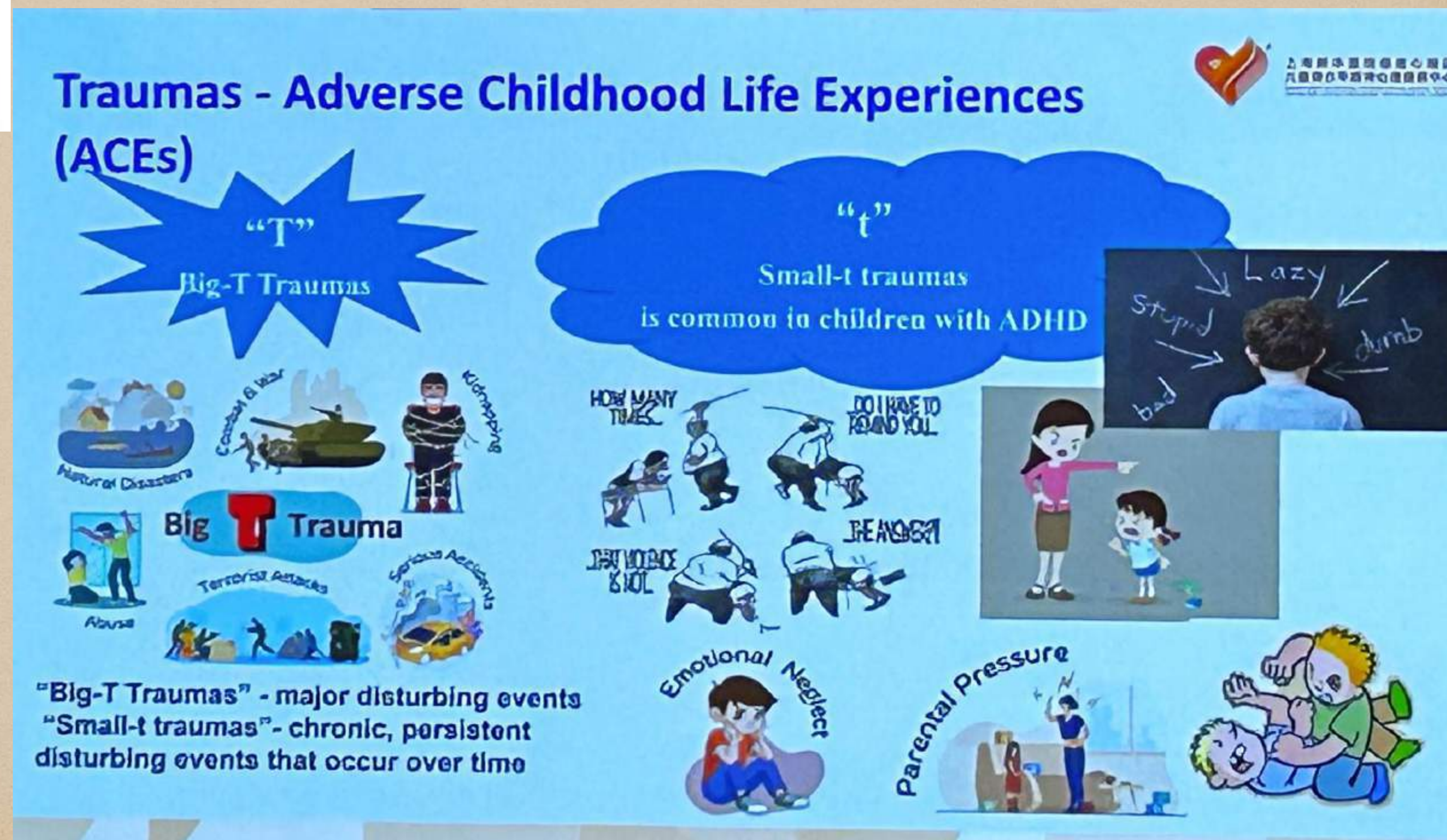
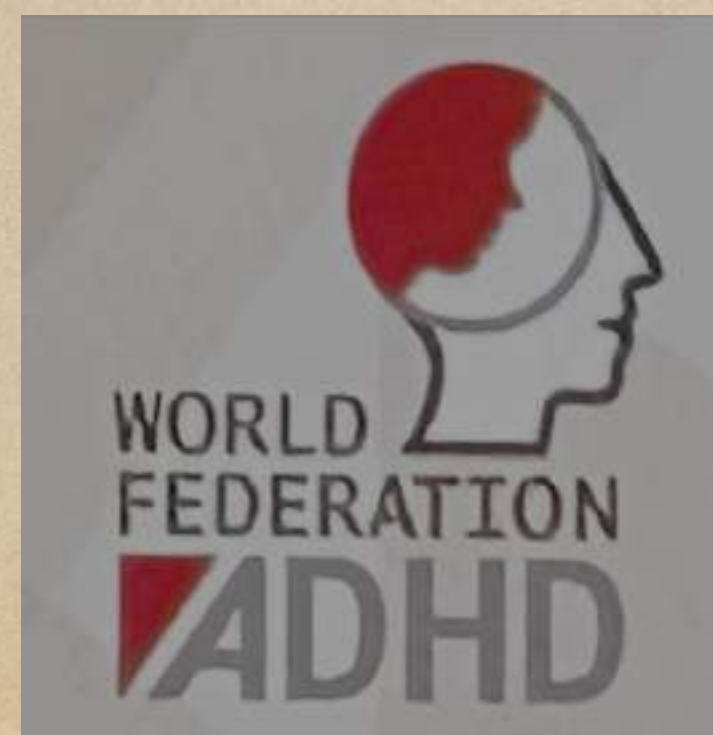
Centre for ADHD
Awareness Canada

Rüfenacht et al 2021, Paulus et al 2021



Always the Elephant-in-the-Room: **Trauma**

Micro-
aggressions
Or Micro-
trauma



(Haahr-Pedersen et al 2020, Visser et al 2024)

The Transition from Child to Adult...Puberty and the Three Great Questions

- Who am I?

"I always felt different"

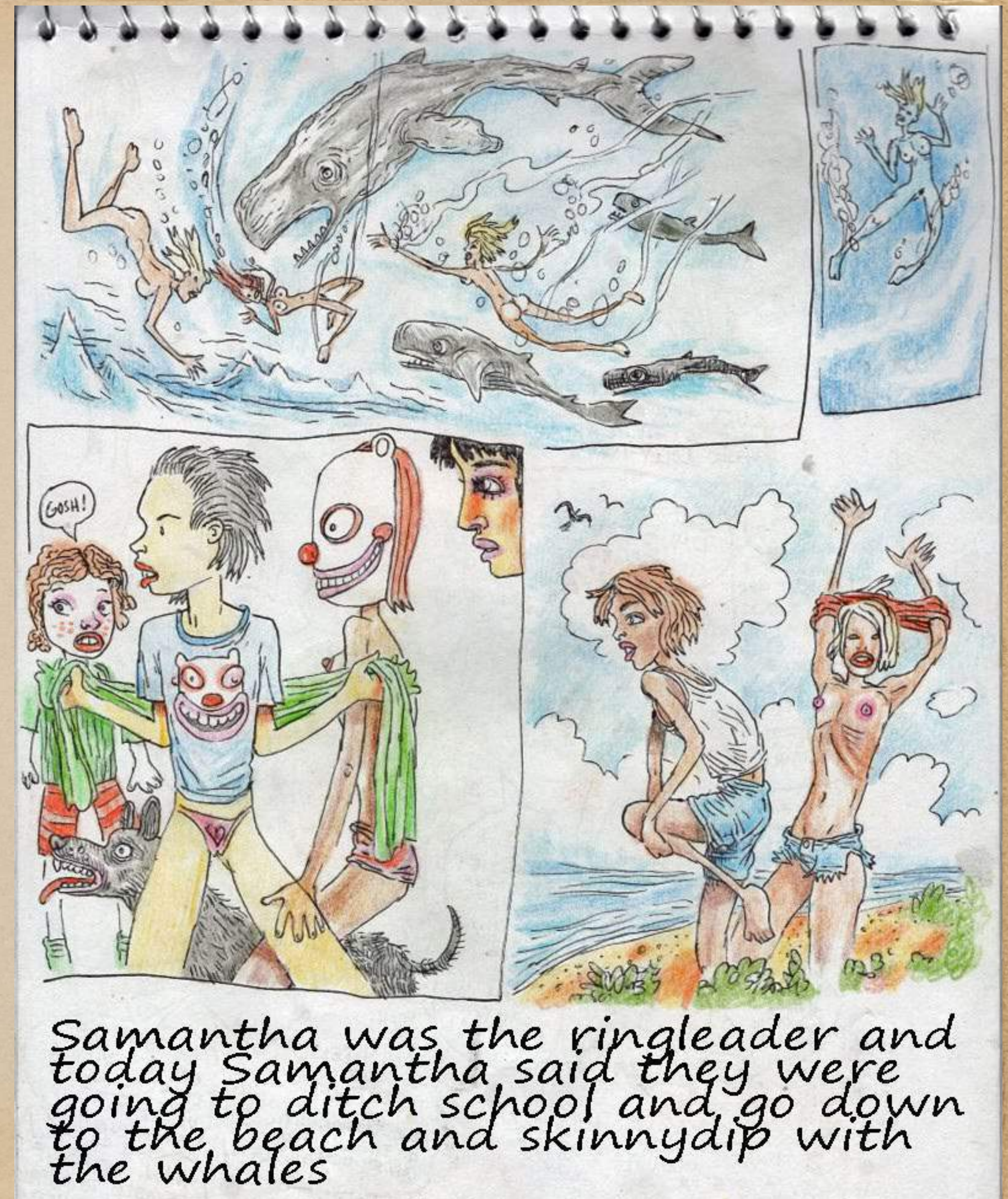
- Am I normal?

"I never got invited to birthday parties"

- What will I become?

"A failure"

Mrug et al 2012, McKay et al 2023, Wiener 2023, Paulson et al 2005.



6 SIGNS OF ADHD IN FEMALES

CHRONICALLY LATE

Many people with ADHD are "time blind" due to executive function impairment. This means overestimating how much they think they can accomplish in a given time. Further, people with ADHD often have a tendency to over-commit and put too much on their plates.



RSD

SENSITIVE TO REJECTION

Females with ADHD often experience rejection sensitive dysphoria (RSD). RSD is an intense vulnerability to the perception – not necessarily the reality – of being rejected, teased, or criticized by important people in your life.



FORGETFUL

Forgetfulness is related to the executive functions in the brain – processes which help us manage, organize, and disperse information. These functions also include planning and thinking ahead. In ADHD, these functions are dysfunctional.



DISORGANIZED

Executive functioning impairment can make it difficult for women with ADHD to prioritize what to do first, how to do it best, and when to do it. As a result, messiness, clutter, and disorganization are very common in females with ADHD.



PERFECTIONIST

For some women with ADHD, perfectionism is often overcompensation for the inner fear they have of not doing things well enough. Many people with ADHD have spent a lifetime being told to "just try harder." Perfectionists take it to the level of trying to prove their worth by being perfect.



TALKATIVE

Females with ADHD may demonstrate impulsive behavior such as interrupting others, talking excessively, or changing topics mid-conversation due to executive function impairment.



Emotional Dysregulation

Eating Disorder (Villa et al 2023)

Women and ADHD

Women with ADHD commonly report these signs and symptoms:



Feeling overwhelmed by housework and daily chores



Feeling restless and even physical pain when having to sit and focus for too long



Often losing important items, like keys, phones, and vital paperwork



Dreading and avoiding tedious tasks, while hyperfocusing on others



Thoughts frequently wandering from one idea and task to another



AOD Abuse

(Elkins et al 2017, Castellano-Garcia 2022)

ADHD “~~TREATMENT~~”

George Orwell: *“But if thought corrupts language, language can also corrupt thought. A bad usage can spread by tradition and imitation even among people who should and do know better.”*

“Treatment” carries connotations of disease or disorder - a failing in the individual in some way.

“ENABLING”, when required by need, acknowledges the capabilities of the individual whilst acknowledging the constraints and limitations of circumstance.



*Genetics X Environment = Who we are
(& how we behave)*

A more radical view of “ENABLING”

If society does not accommodate ADHD functioning then we “treat” the SparkleBrain to enable “normal” functioning:-

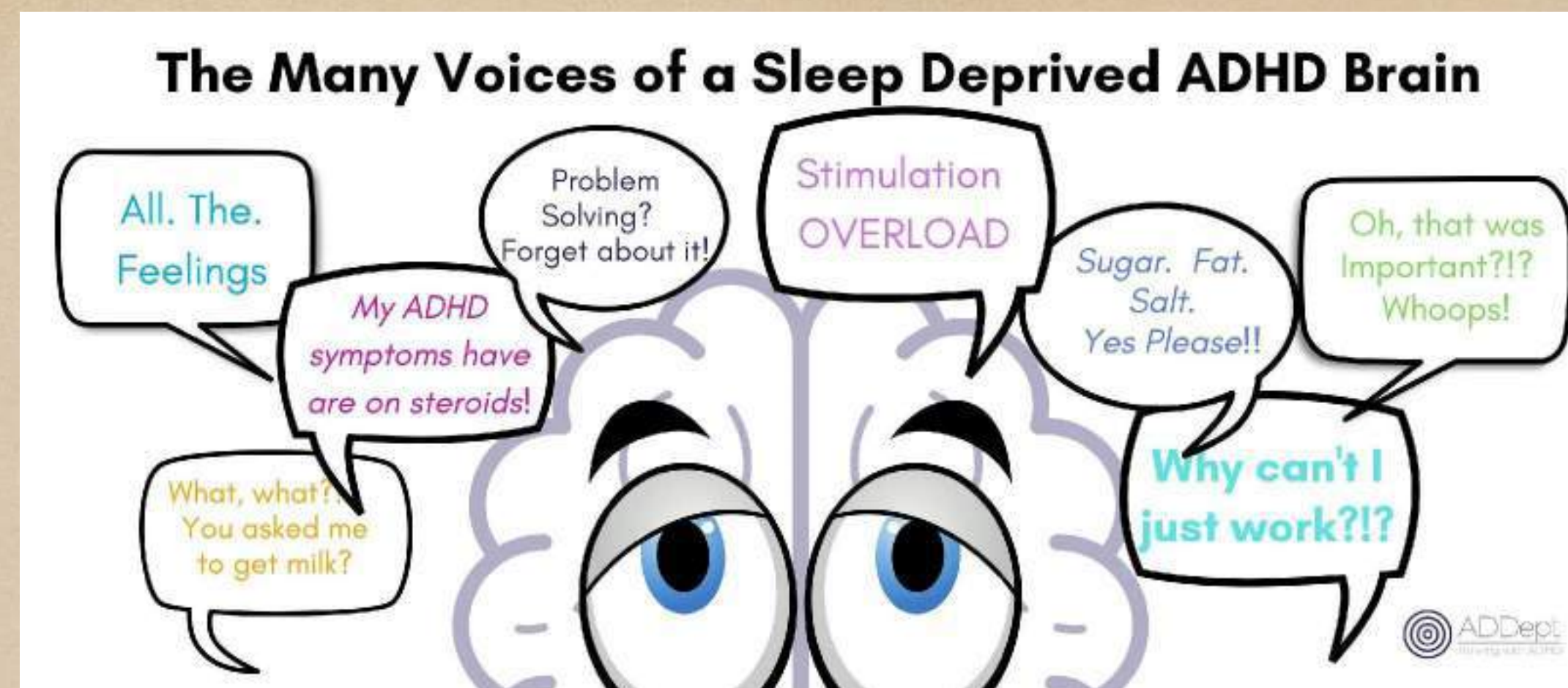
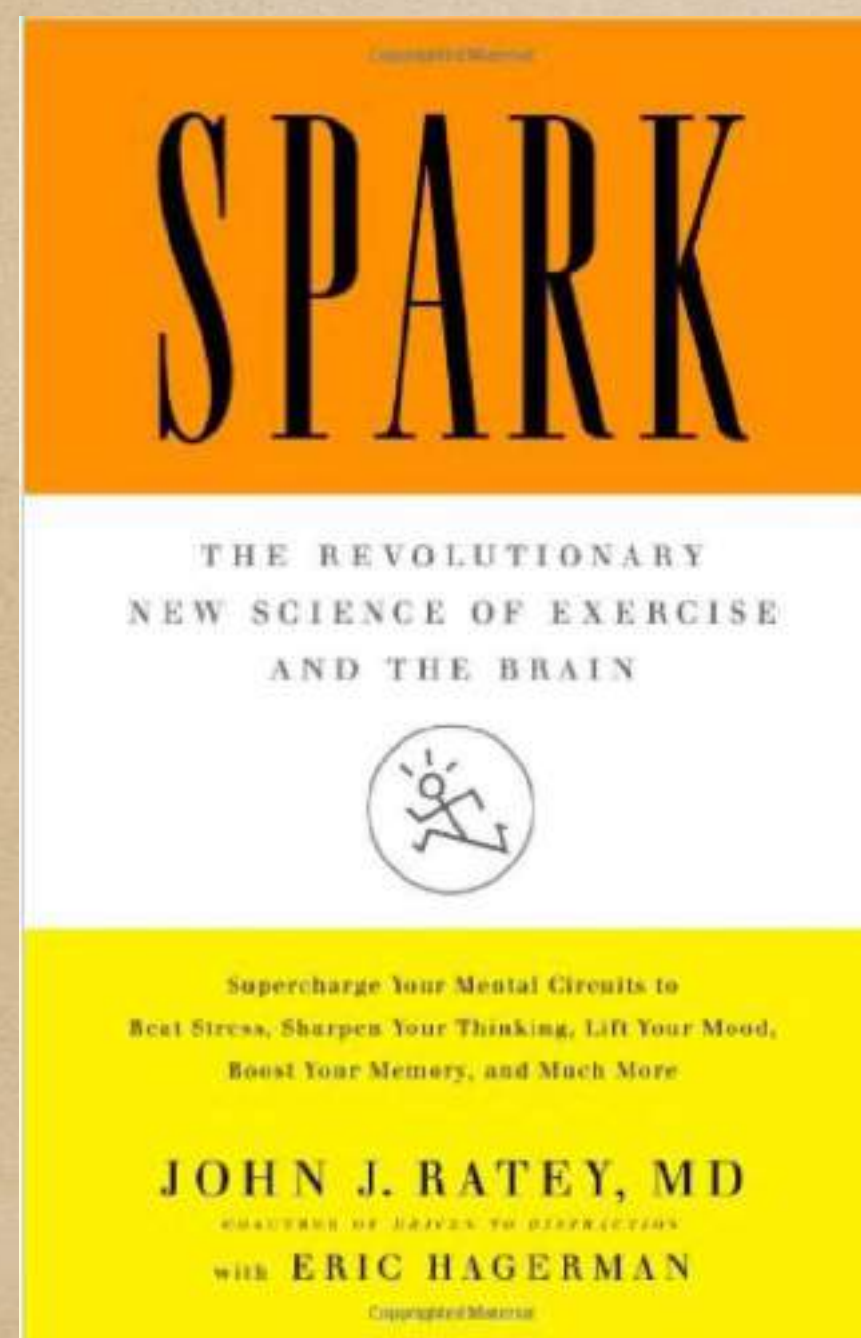
Where “normal” means to cope and function effectively within the failure of schools, universities, workplaces, the Justice systems, etc etc to accommodate the SparkleBrain, as they accommodate the “normal”.

However, in children, this may mean “normalising” ADHD unique brain structures with medication...a “disordered” view of ADHD (Wu et al 2024).

My top 5 exercises:

- 1) jumping to conclusions
- 2) flying off the handle
- 3) carrying things too far
- 4) dodging responsibilities
- 5) pushing my luck

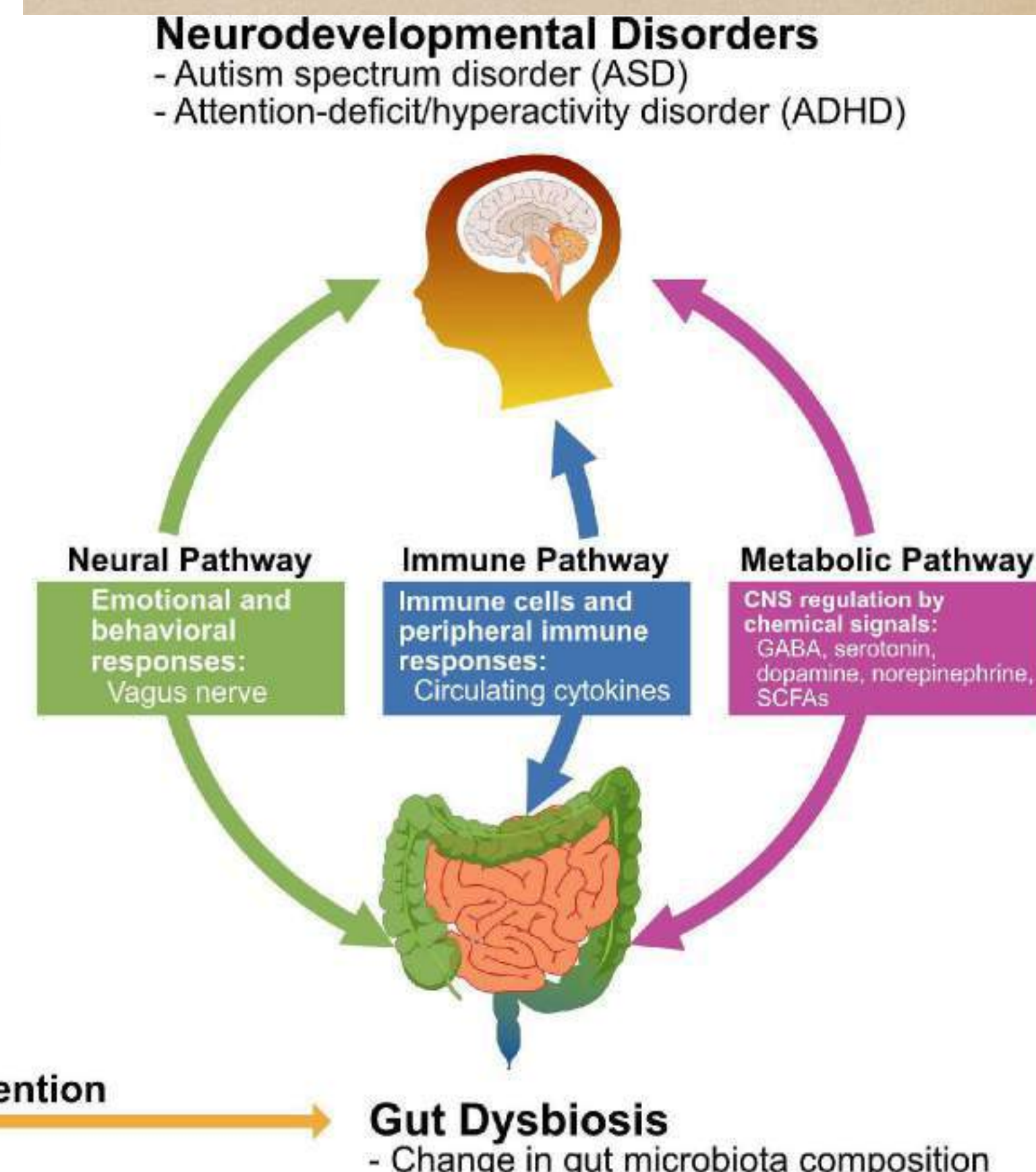
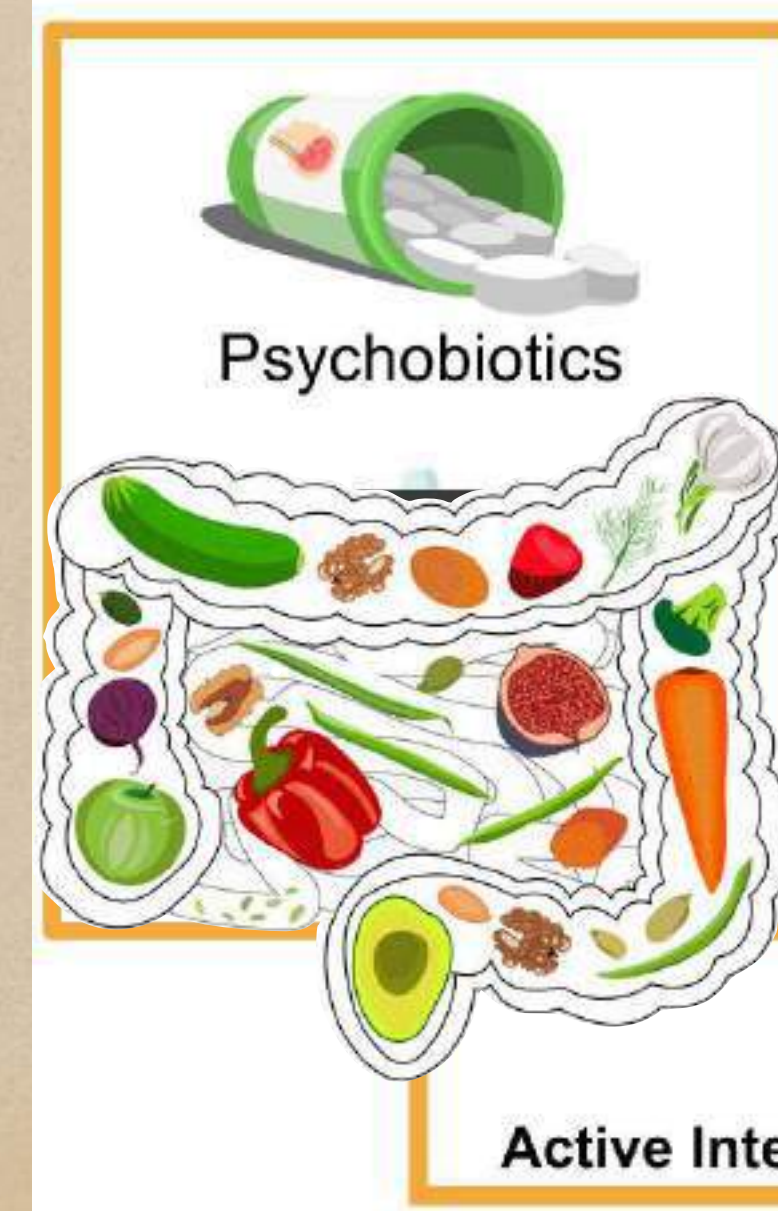
someecards
user: oard

How to Reduce Chronic Inflammation

 Maintain a healthy weight.	 Eat a healthy and balanced diet.	 Minimize ultra-processed foods.
 Limit alcohol.	 Stay hydrated.	 Avoid smoking.
 Exercise regularly.	 Practice stress management.	 Get enough sleep.

SH



Enabling through ADHD Coaching & Scaffolding

4 STAGE ADHD TREATMENT PROGRAM



BRAIN OPTIMISATION PROGRAM

NEUROFEEDBACK
SLEEP
DIET



COGNITIVE ENHANCEMENT PROGRAM

ATTENTION
EXECUTIVE FUNCTIONING



ADHD PSYCHOTHERAPY PROGRAM

MOOD
RESILIENCE



ADHD BEHAVIOUR PROGRAM

PARENTING
SCHOOL
COACHING

ADHD Classroom Support

Scaffolding Time Awareness

Play With Time



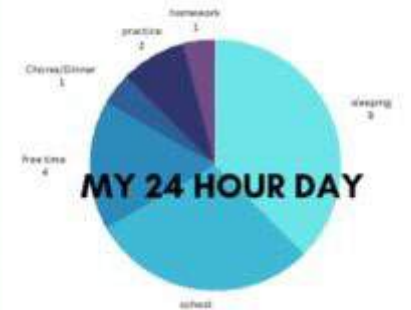
Play games to feel time moving

Reality Testing



Time estimation/ actual time comparison to gain awareness.

Time Budget



Build a Time Bank



Inventory of Common Task Durations

Visual Models of Future



Use a timer that give a visual of the amount of time left

Plan Backwards



Plan backwards, Execute Forwards

Find much more at www.ot4adhd.com

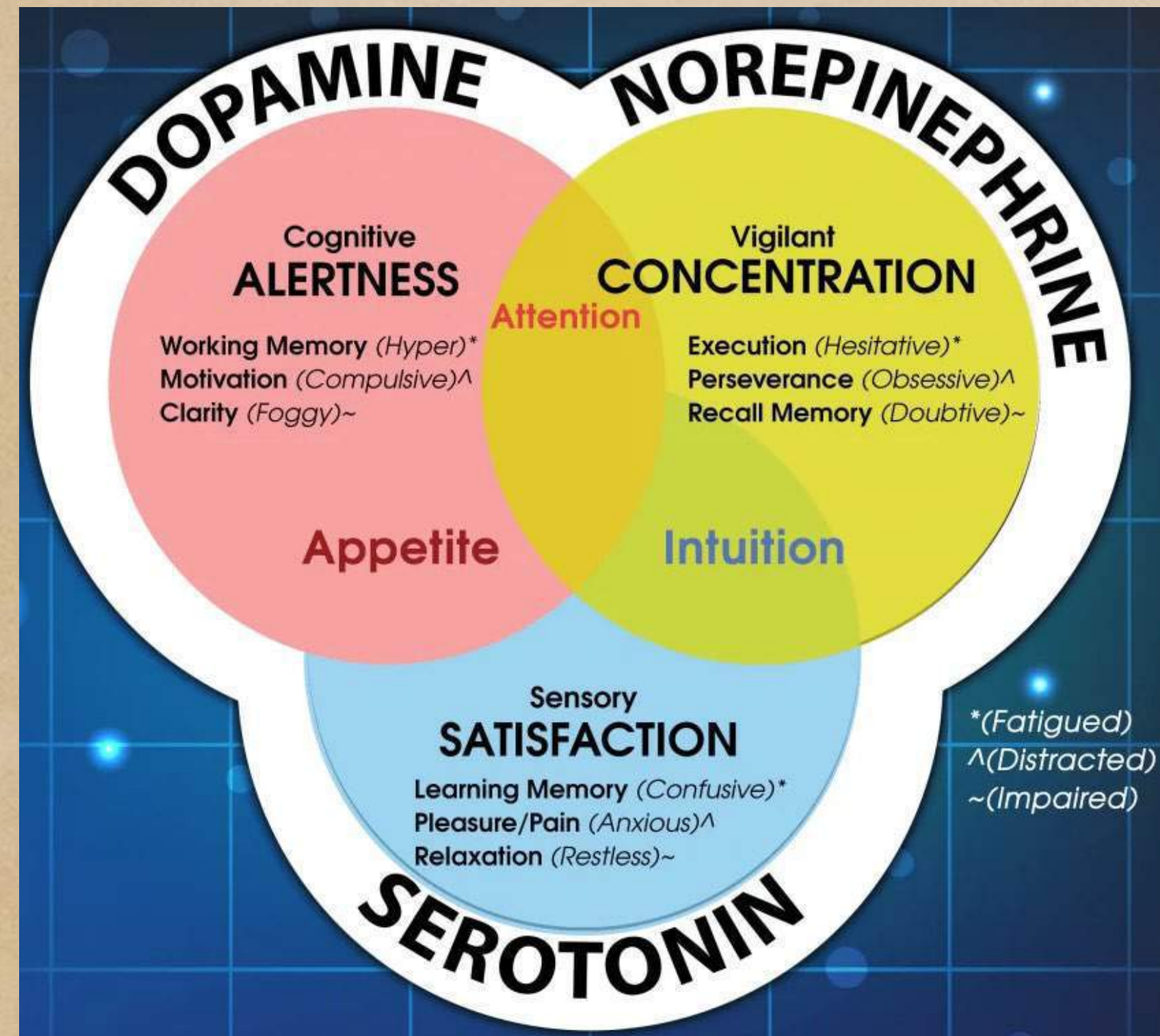
Enabling through Accommodations

Reasonable Workplace Accommodations



Workplace accommodations for (eg) single working parents to take themselves or children to ADHD assessments without penalty of losing personal leave or income.

Enabling through Antidepressants



Atomoxetine (Strattera) - primarily for ADHD: effective also for ADHD associated anxiety Khoodoruth et al 2022

Bupropion (Zyban) - modestly effective both standalone and in conjunction with stimulants Wilens 2005

SSRI (especially fluoxetine) - modestly effective standalone in some. Good for associated anxiety and OCD.

SNRI (especially venlafaxine & duloxetine) - Duloxetine more potent in reducing ADHD symptoms. Venlafaxine more effective in females, & more effective on inattentive symptoms of ADHD rather than hyperactive symptoms.

Dezfouli et al 2024

Enabling through Alpha-2 Agonists

Clonidine and Guanfacine (Intuniv): stimulate alpha-2 adrenergic receptors in the prefrontal cortex, which helps improve noradrenaline and dopamine neurotransmission.

More effective for hyperactivity and impulsivity than inattention

Particularly useful in Tic Disorders or some cardiac conditions, when stimulants contraindicated

Lower heart rate and blood pressure, hence diminish anxiety but also can cause fatigue, sedation and POTS

Abruptly ceasing (especially higher doses) can cause rebound hypertension

Can useful to augment high dose stimulants. Clonidine useful in initial insomnia secondary to “ADHD Brain”

Enabling through Stimulants - the GOLD Standard

Dexamphetamine, Methylphenidate & Modafinil. Long acting formulations of Methylphenidate. Lisdexamfetamine a unique long acting form of Dexamphetamine.

Pleiotropy means it is not possible to predict individual response nor effective dose: - a **titration protocol MUST be used**, usually with IR (Immediate Release), though titration of long acting forms is possible (if fiddly).

Most commonly, titration over a period of weeks (& very occasionally months) leads to a pattern of mane and midi dosing, with occasional late afternoon “top up”. This enables several options:-

- Remaining on IR forms for full control

- Conversion to once daily long acting forms only

- Conversion to once daily long acting forms with Regular/PRN IR “top ups”

Combining Medications

Medications are not uniform in their effectiveness for different symptoms:-

- Dexamphetamine may be more effective for cognitive function improvement
- Methylphenidate may be more effective in reducing impulsivity and emotional dysregulation
- Alpha-2 agonists and antidepressants may be more effective in reducing hyperactivity and emotional dysregulation.
- Combinations reflect the pleiotropic variation in symptom expression.

On occasion, combinations of long acting forms provides the best response: this may be of the same medication or different medication.

In children, long term stimulant treatment may alter brain structure development in those areas associated with ADHD (Wu et al 2024, Bouziane et al 2019) to “normalise” those structures.

Implications for treating Jane

Lifestyle factors in improving immune function and reducing circulating inflammatory markers:

Diet, including natural remedies such as Feverfew (Barakhat 2023, Scheiber & Mank 2023, Kurowska et al 2023, Verlaet et al 2014)

Microbiome Health (Checa-Ros 2023, Lewis et al 2025, Brown et al 2025))

Mindfulness & Anxiety Reduction: Yoga, Exercise (Taherkhani 2020, Cook et al 2024)

Sleep: (Diaz-Roman et al 2018, Engert & Besedovsky 2025, [Dzierzewski](#) et al 2020 - especially in women)

Implications for medication treatment of Jane

Medications in improving immune function and reducing circulating inflammatory markers:

SSRI: (Patel et al 2023, Reneaux et al 2025, Izumi et al 2023)

ADHD Medication: reduce anxiety & “enable” effective functioning, thus reducing (oxidative) stress & “burnout”.

HRT: Oestrogen has anti-inflammatory properties, which is important in (peri)menopause but also in reproductive years if there is hormonal derangement, or endometriosis, for example. (Harding & Heaton 2022, McCarthy & Raval 2020, Zhang et al 2024)

Interaction Analysis

DRUGBANK Explore ▾ For Drug Discovery ▾ For Clinical Software ▾ For Academic Research ▾

Interactions Found

		SEVERITY ?	DESCRIPTION
Anxiety →	Duloxetine	 Dextroamphetamine [Dexedrine] →	MODERATE The metabolism of Dextroamphetamine can be decreased when combined with Duloxetine.
EXTENDED DESCRIPTION		The subject drug is a moderate CYP2D6 inhibitor and the affected drug is metabolized by CYP2D6. Concomitant administration may decrease the metabolism of the affected drug, leading to increased serum concentrations. READ MORE	
REFERENCES		VandenBrink BM, Foti RS, Rock DA, Wienkers LC, Wahlstrom JL: Prediction of CYP2D6 drug interactions from in vitro data: evidence for substrate-dependent inhibition. Drug Metab Dispos. 2012 Jan;40(1):47-53. doi: 10.1124/dmd.111.1. READ MORE	
Endometriosis →	Goserelin [Zoladex]	 Duloxetine	MINOR Goserelin may decrease the excretion rate of Duloxetine which could result in a higher serum level.
EXTENDED DESCRIPTION		The renal excretion of drugs is the overall result of a combination of kidney processes that include glomerular filtration, passive diffusion, tubular secretion, and tubular reabsorption. ⁴ Since two of these mechanisms - tubular secretion and tubular reabsorption - are affected by Goserelin, the excretion rate of drugs may be decreased. READ MORE	
REFERENCES		Tiong HY, Huang P, Xiong S, Li Y, Vathsala A, Zink D: Drug-induced nephrotoxicity: clinical impact and preclinical in vitro models. Mol Pharm. 2014 Jul 7;11(7):1933-48. doi: 10.1021/mp400720w. Epub 2014 Mar 3. [Article] READ MORE	

In complex cases, with several medications, interaction analysis becomes important:-

<https://go.drugbank.com/drug-interaction-checker#>

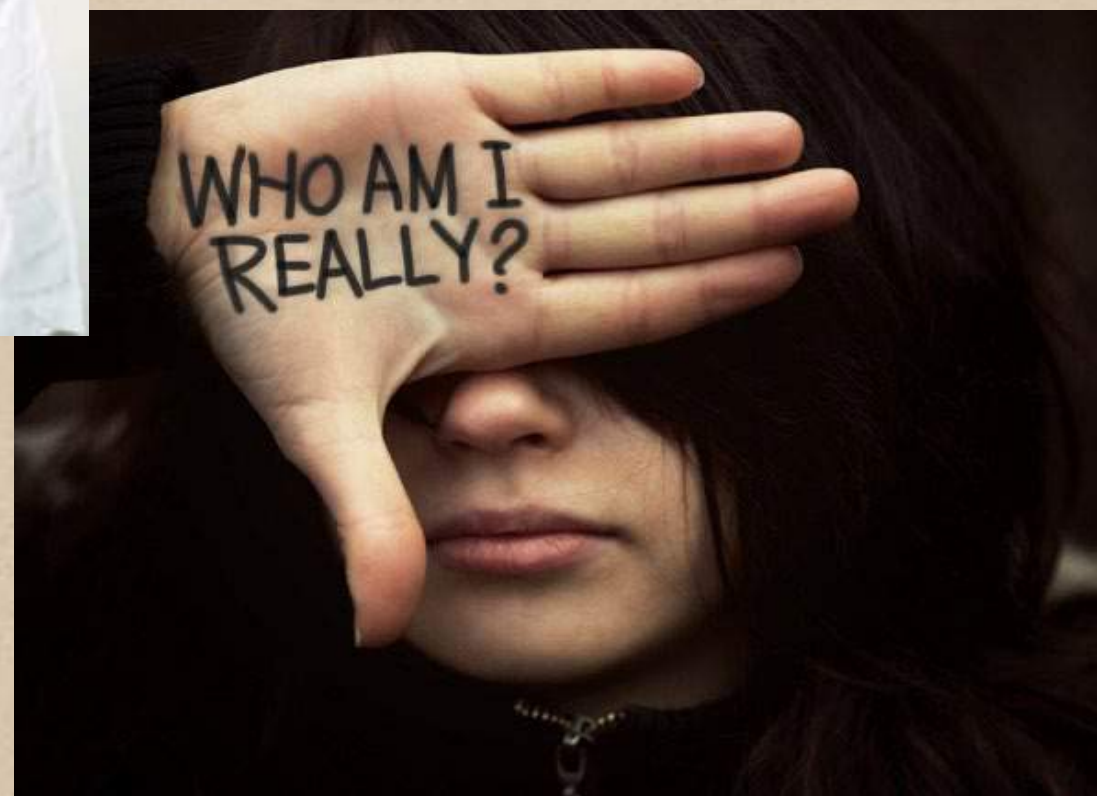
Late Diagnosis

And

What changes
with treatment



Who am I ?



Who Am I ?

Before and After:- The Swan

A typical Female Sparkle Brain arrives for assessment after, let's say, 20 to 30 years from adolescence with emotional dysregulation, rejection and judgment sensitivity, perfectionism, people pleasing, and a negative self perception.

Juggling the demands of increased work demands, raising children (even with a helpful Husband, but often alone - a story in itself), or with "Baby Brain", she is overwhelmed with the competing demands on her time, the challenges of organisation, of starting a task and finishing without diverting to something else, of maintaining her fragile relationship.

After

An initial titration of Dexamphetamine or Methylphenidate over 2 to 4 weeks (or longer) is followed by a review: a cool, calm, collected Woman **Swans** into the room, gracefully sits down and announces “It’s been life changing”. No longer the twiddling and twirling of hair, the endlessly long explanation of a symptom; instead, happy stories of a tidy house, work projects started and completed, no explosions of irritability or frank anger at boisterous children or annoying partner, a voiced change in self perception “**I’m the best version of myself I can be**”.



Bess...& the Zombie Effect

Bess is a 44yo woman, separated this year from an(other) established relationship, who has a history of parental separation in early childhood with care mainly provided by her Father. She works in a very high stress environment, with multiple roles often requiring crisis management. She has ADHD of the Combined type, persisting into adulthood largely unchanged.

She is something of a whirlwind, though is negative for thyroid over-activity or hypomania, with a compelling need for certainty and control, evident in relationships and her workplace.

Bess describes significant mood and emotional fluctuation, within the same day, which on closer exploration is characterised by irritability and often anger, triggered by the behaviours of others in her relationship or her workplace.

Often, she strives to control it but then frequently expresses it when alone: “... *because I am not whizzing around distracting myself, it has poured from me in uncontrollable tidal waves of tears...It’s not sadness though... Just letting it out it without noise and movement and anger*”

Bess: Zombie

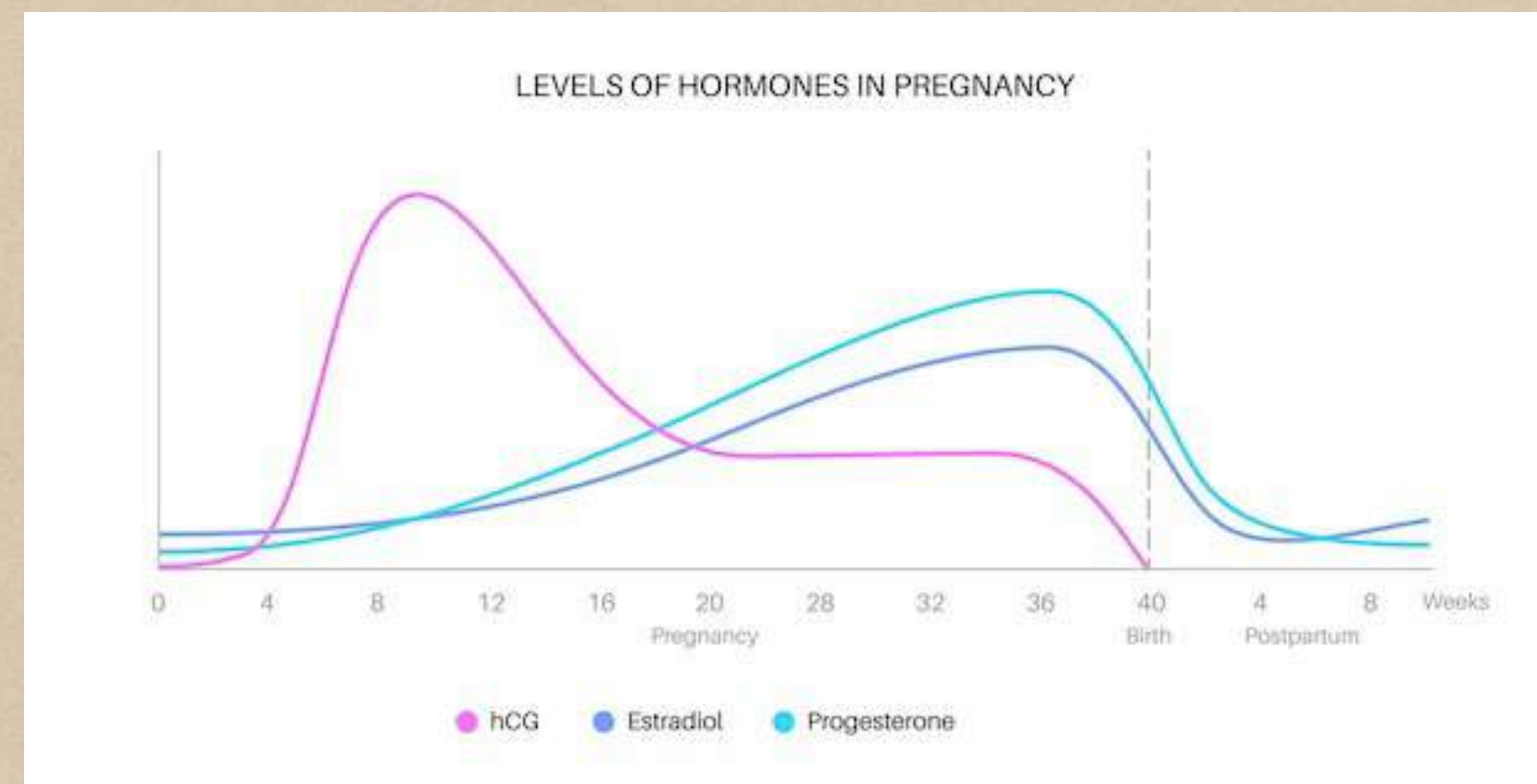
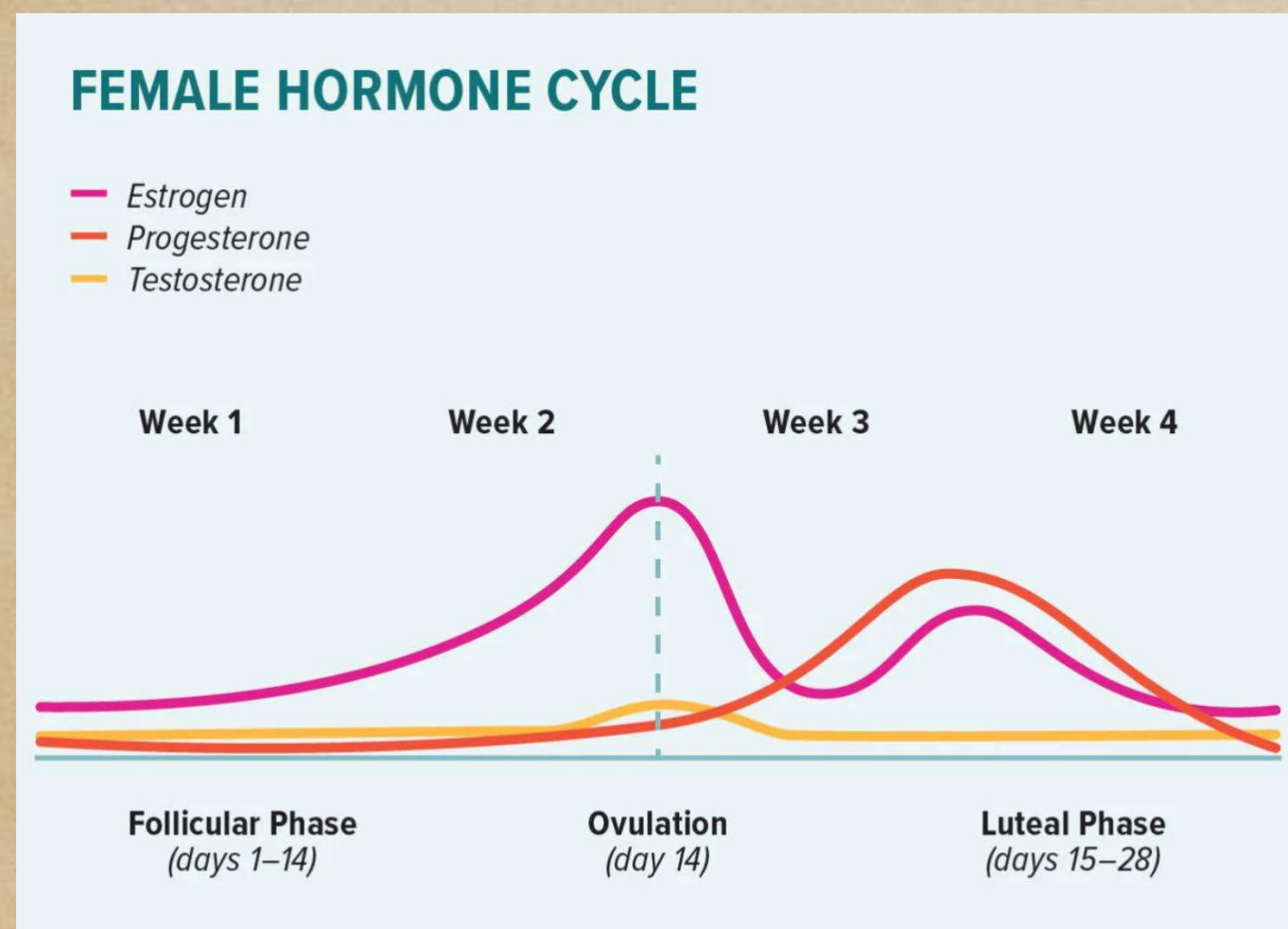
- Bess' cognitive function is significantly improved by DexIR 10mg TDS, but her emotional dysregulation and impulsivity/hyperactivity (expressed as "Sex & Downhill Running") are less well controlled. DexIR is increased & converted to Vyvanse.
- She commences RitalinIR to titrate to dose: a few days later an email says "Ritalin makes me a **Zombie**, I'm not taking it". Several months pass and she travels to Japan for several weeks, with Vyvanse 50mg mane/20mg midi and RitalinIR to supplement (she can't take DexIR to "top up PRN").
- 2 weeks later, after titrating Ritalin IR to best effect, she emails "F**k you, Chapman, you were right".
- On her return she converts to RitalinLA 20mg mane/30mg midi in addition to her Vyvanse with dramatic improvement in emotional regulation and impulse control (but not in other areas).



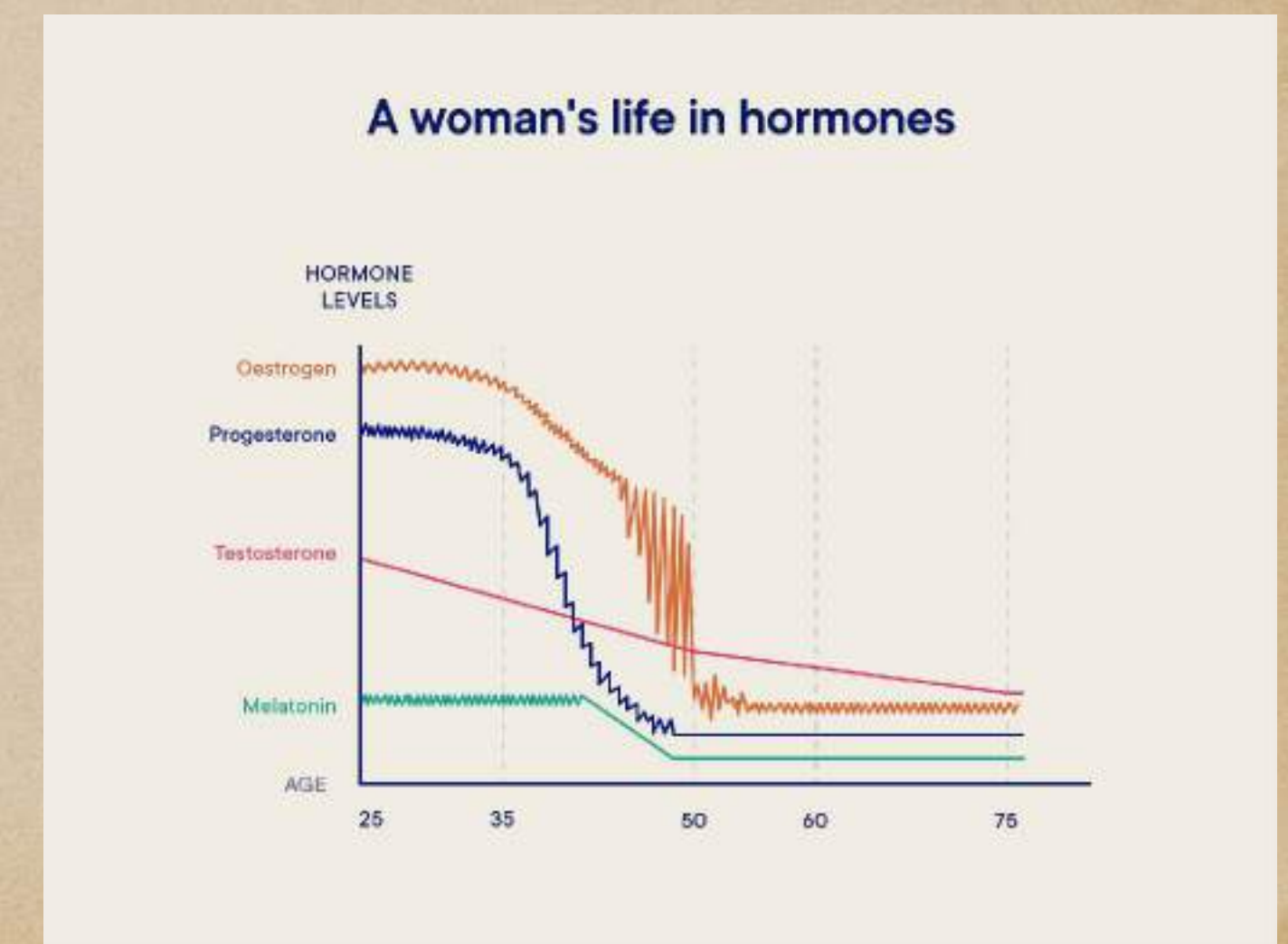
“Double, double, toil and trouble; fire burn and cauldron bubble”

HORMONES: Oestrogen, Progesterone, Testosterone...& Melatonin

Menarche & Menstrual Cycle

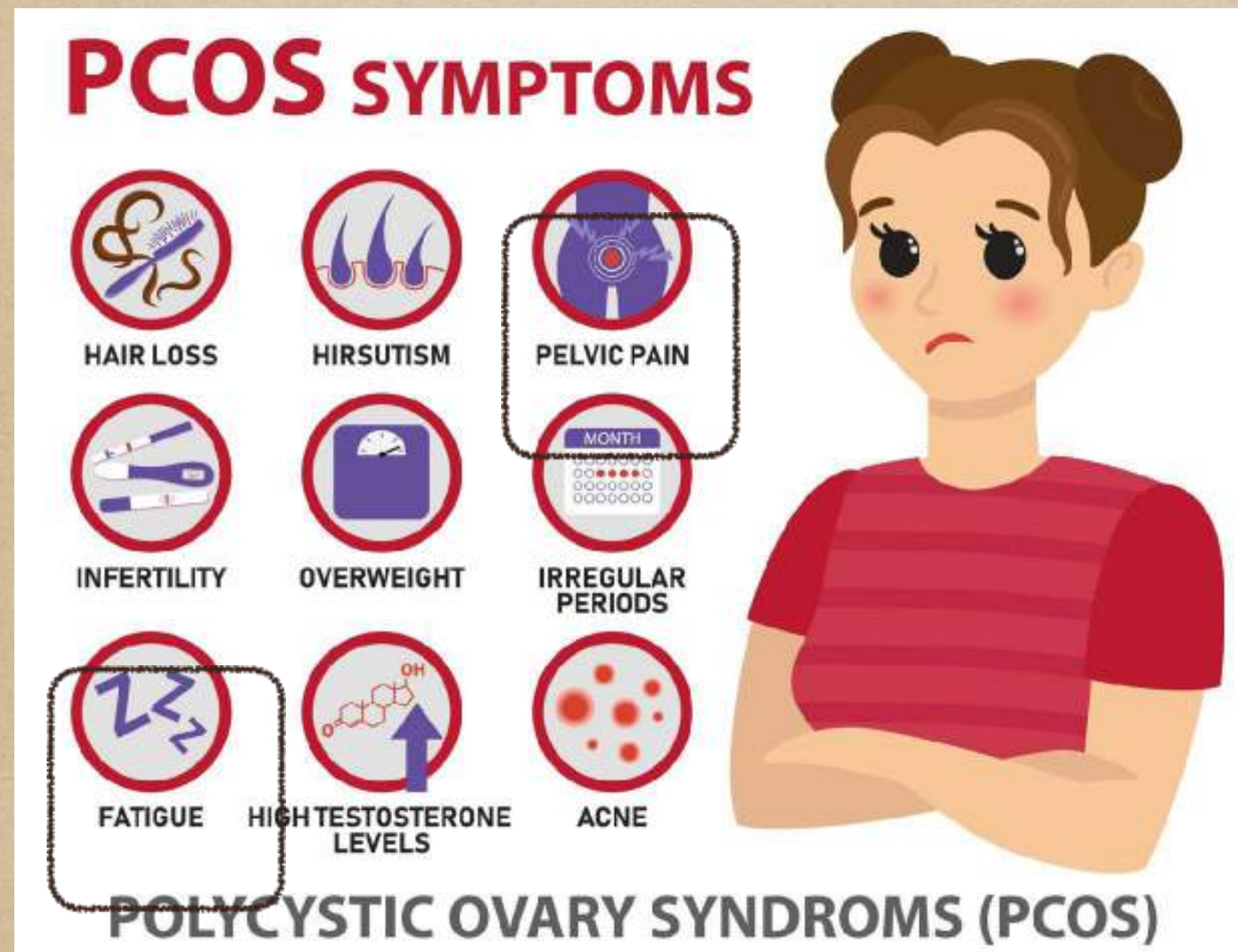


(Peri)Menopause



Matrescence

Hyperandrogen ... or Hypoandrogen

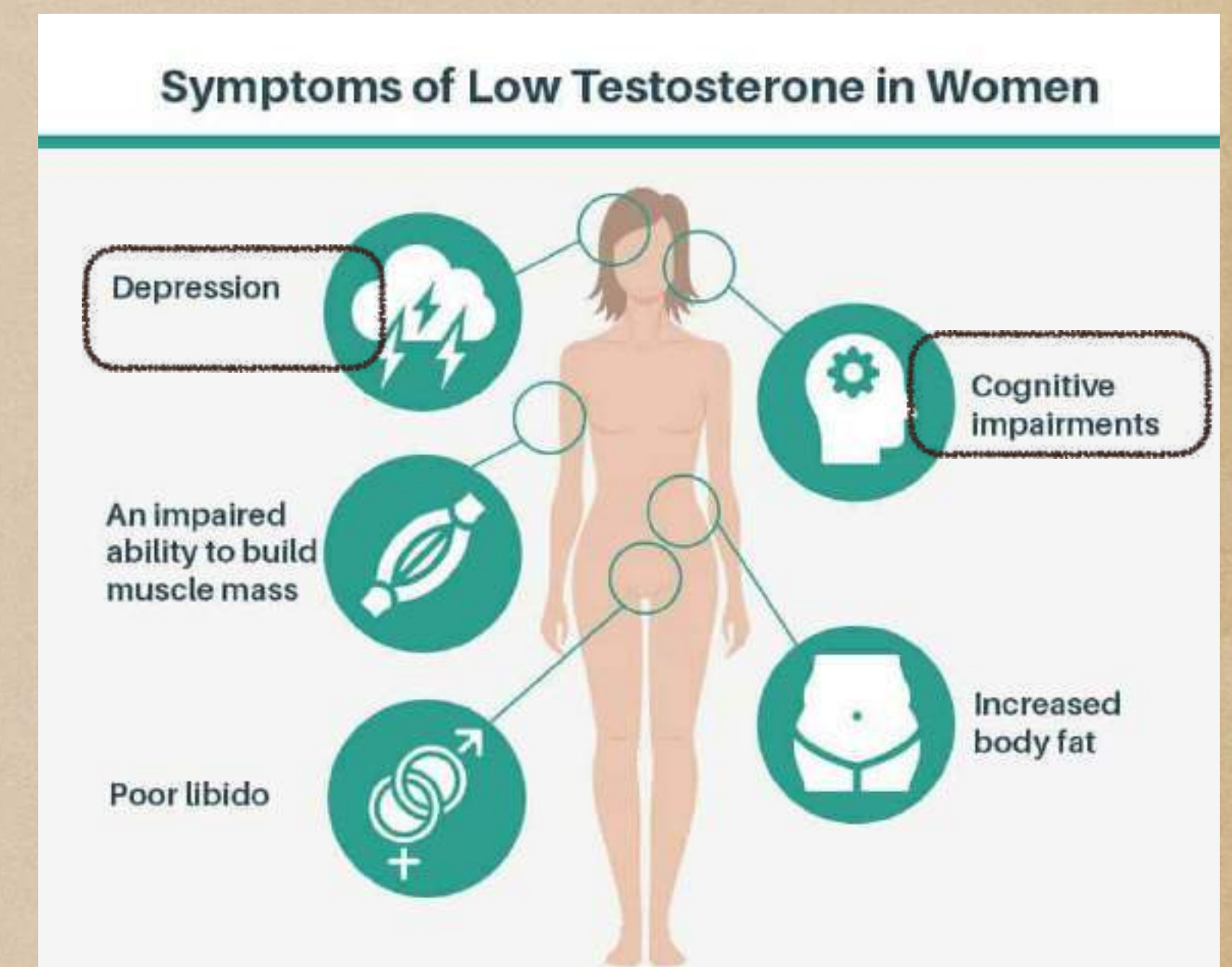


Ovarian Cysts not required!
(Ovarian Dysmetabolic Syndrome?)

Herguner et al, 2015; Maleki et al 2022



Adrenal hyperplasia or a tumour



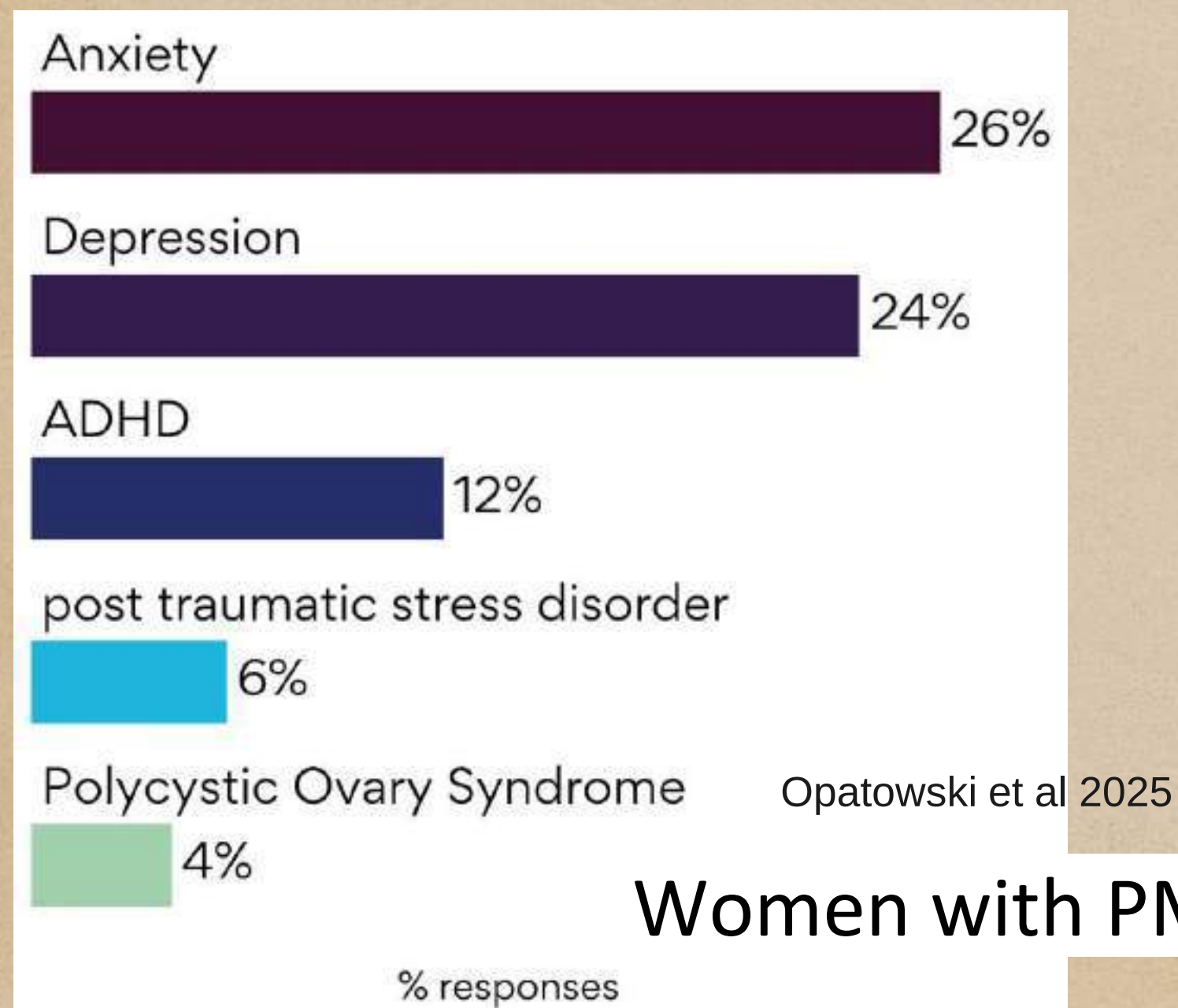
Prolonged opioid or stimulant use, Genetics, perimenopause, oophorectomy, POI

Ostdiek-Wille et al 2024

Women with ADHD:

- Have a higher risk of PMDD (46% vs. 29%).
- Have a higher risk of post natal depression (58% vs. 14-20%).
- Are much more likely to experience intense symptoms during perimenopause.

2021 The Journal of Psychiatric study

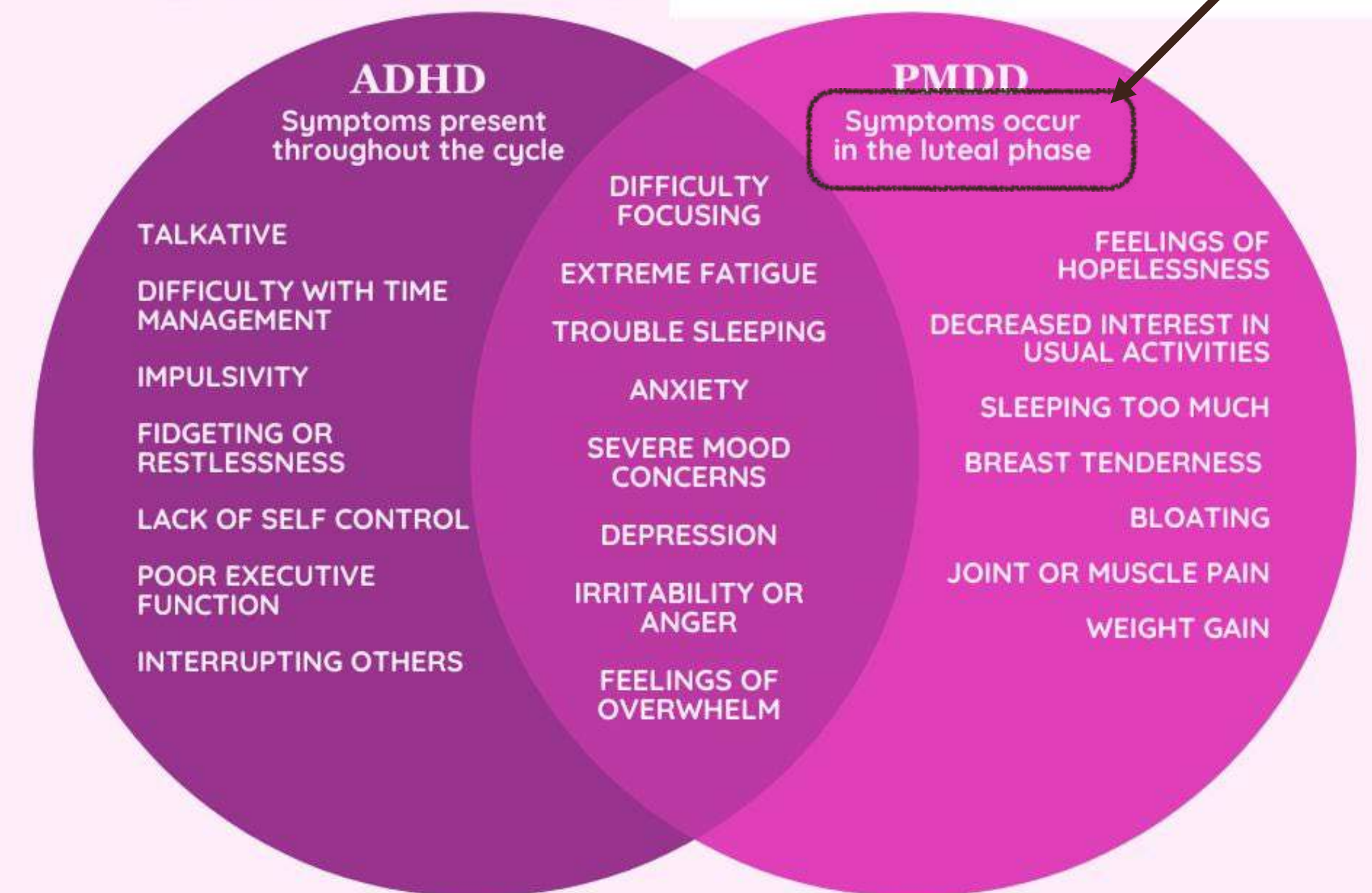


Women with PMDD

Hormone Sensitivity

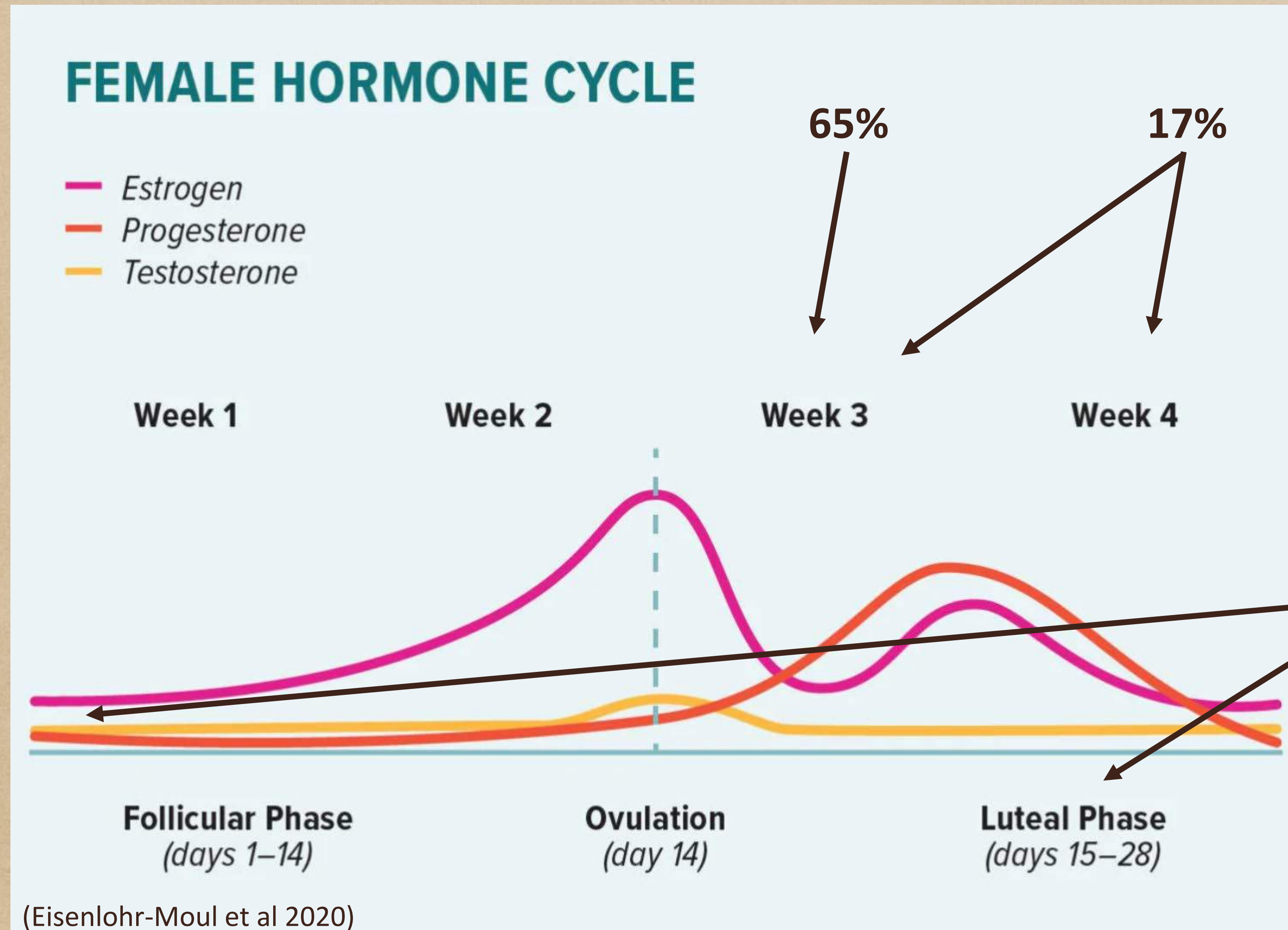
ADHD vs PMDD SYMPTOMS

drbrighten.com



...and serotonin is awry as well...

PMDD Across the Cycle



Is it PMDD, or is it
ADHD, or is it Both?
... think change in
hormone levels...

...and does it affect
treatment?

Menstrual Cycle, Hormones, Medication and Symptoms

ADHD symptoms worse

Roberts et al 2018

Eng et al 2024

Stimulants less effective

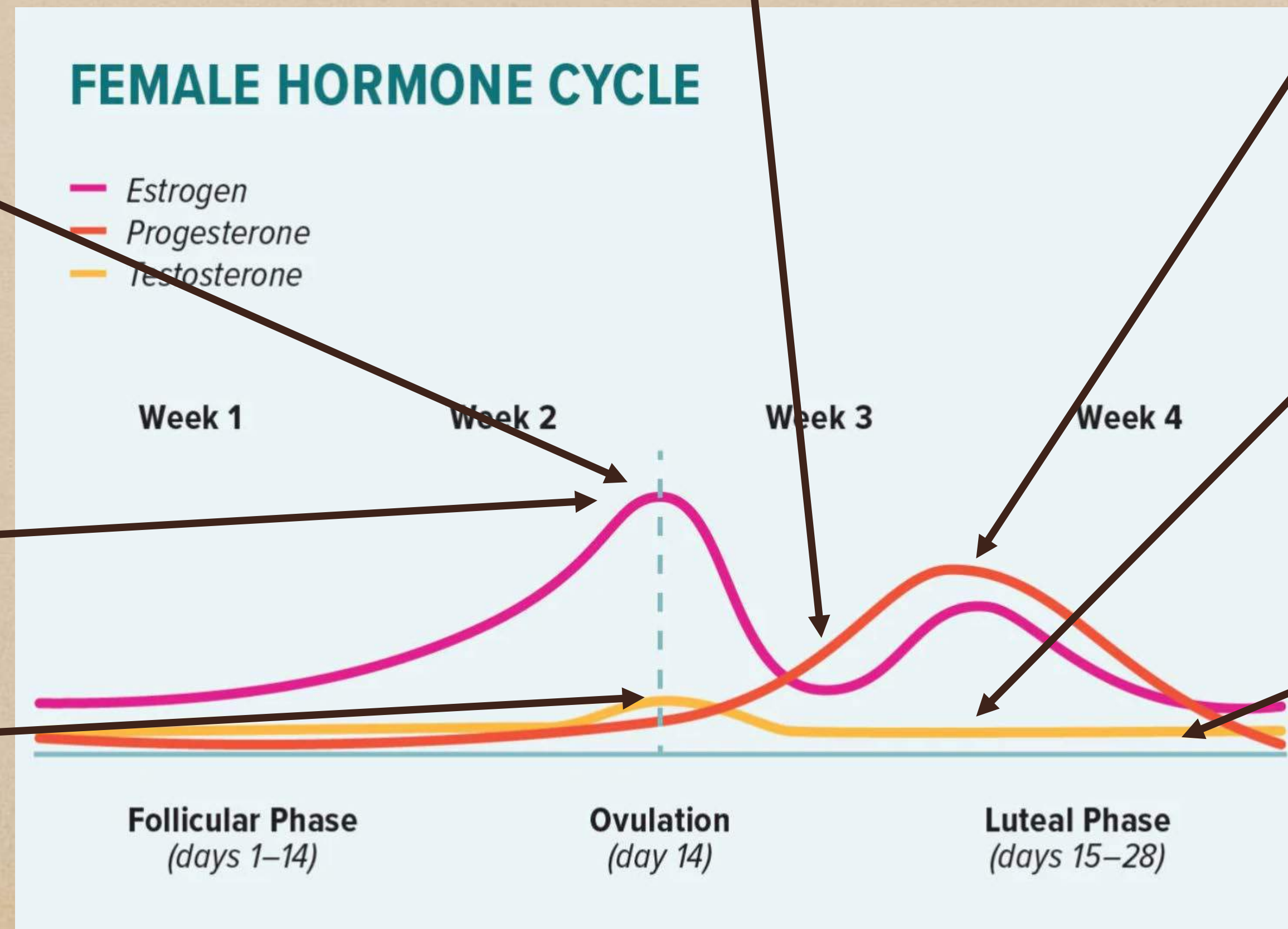
Burger et al 2024

Stimulants more effective

Justice & de Wit 1999,
White et al 2002

ADHD symptoms reduced

Burger et al 2024
Eng et al 2024



Testosterone blocked by Progesterone

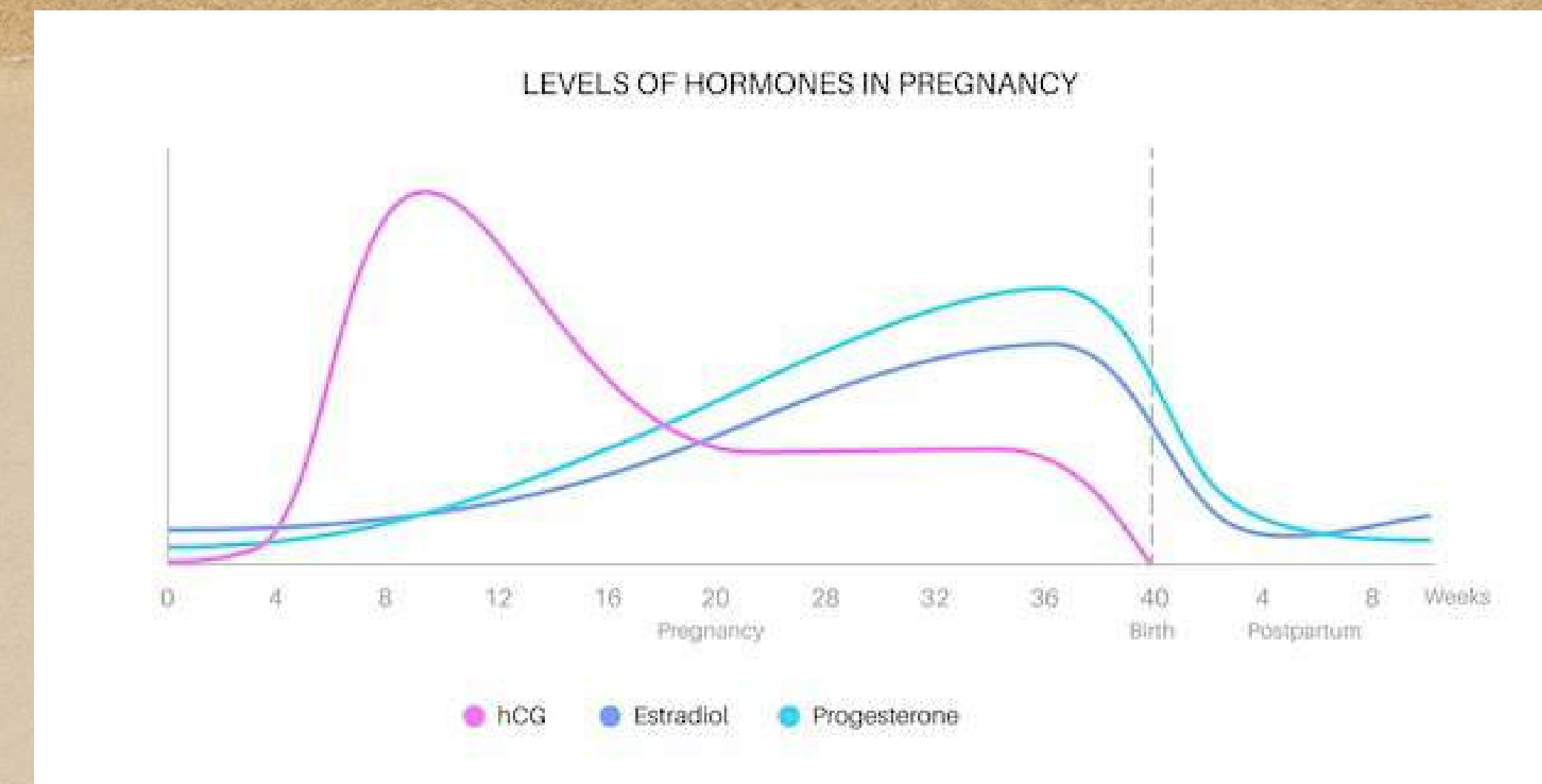
Testosterone reduces ADHD Symptoms

The Plot Thickens... Matrescence

- **Conception:-** it (usually) takes two to party and there is some evidence that stimulant treatment can reduce the viability of sperm through reducing sperm count and motility, perhaps via reduced testosterone. (Patel et al 2016; Pham et al 2022)
- **No clear evidence** of ADHD or Stimulants affecting female fertility - though little research!
- However, there is a greater risk of AOD use, STDs, and young or unplanned pregnancies in post pubertal girls (cf impulsiveness or self-identity issues). (Rokeach et al 2018, Isaksson et al 2017)

Pregnancy

- Great **physical & hormonal** changes
- “**Brain Fog**” - fluctuating hormones and **brain changes** in progress:
- A huge rise in oestrogen may reduce ADHD symptoms and perhaps enable reduction in medication.
- However, brain changes endure (well) beyond pregnancy and a precipitate fall in oestrogen will see a return of ADHD symptoms, compounding the continuing Brain Fog.
- ...& perhaps **postpartum thyroiditis** is triggered (complicating late diagnosis &/or medication dosing).



	Early Pregnancy	Late pregnancy
Methylphenidate	No consistent association with overall defects (~5000 exposures); possible small increased risk of cardiac septal defects (NNH estimates range from 92-333); possible increased risk spontaneous abortions.	Small increased risk of preterm birth. Possible increased risk of preeclampsia, SGA, placental abruption, low Apgar score, NICU admission, CNS disorders, induced terminations
Prescribed amphetamines	No consistent association with malformations (~5500 exposures).	Small increased risk of preterm birth and preeclampsia. Possible increased risk of SGA, placental abruption, NICU admission, CNS disorders.
Bupropion	No consistent association with malformations (~2300)	No adverse effects (small studies)
Atomoxetine	No consistent association with malformations (~450 exposures)	Mixed evidence (~700 exposures)
Guanfacine	Too few exposures to say (~30)	Low birth weight (very small studies)
Clonidine	No based on data from women with HTN	Reduced fetal growth

Medication in Pregnancy

Post Partum Breast Feeding

	Breastfeeding?
Methylphenidate	Low levels in breastmilk, undetectable in infant serum. Limited data without adverse effects
Prescribed amphetamines	Infant dose 5-15% maternal dose. Very limited data without adverse effects.
Bupropion	Nursing infant exposed to 2% maternal dose; 2 case reports of seizures at 6 months
Atomoxetine	Unknown
Guanfacine	Unknown
Clonidine	Excreted in breast milk. Adverse events reported (hypotonia, drowsiness, apnea, seizure)

- Typical stimulant doses unlikely to affect milk supply
- High dose stimulants may reduce milk supply
- Atomoxetine and guanfacine - little evidence for change to milk supply.

Breast Feeding & ADHD: a useful Database
Milk production Drugs and Lactation Database (LactMed®) [Internet]. Bethesda (MD): National Institute of Child Health and Human Development; 2006-. Updated 2025 Jun 15].
 Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501741/>

21st Century - & the Late Diagnosed SparkleBrain

Stop telling women they can do it all. We don't want to. We would like someone else to do it, so we can take a nap.

David Jay

- 20-something years of high functioning Medicine, Teaching or Law (HELP)
- No idea about ADHD. Developed amazing coping strategies, but: perfectionist, people pleaser, RSD & social anxiety, Imposter Syndrome, self blaming, emotionally dysregulated... & an incredible actor
- Then **Perimenopause** arrives...



DID YOU KNOW THAT SOCIAL ANXIETY DISORDER IS ONE OF THE MOST COMMON COMORBID CONDITIONS FOR PEOPLE WITH ADHD?

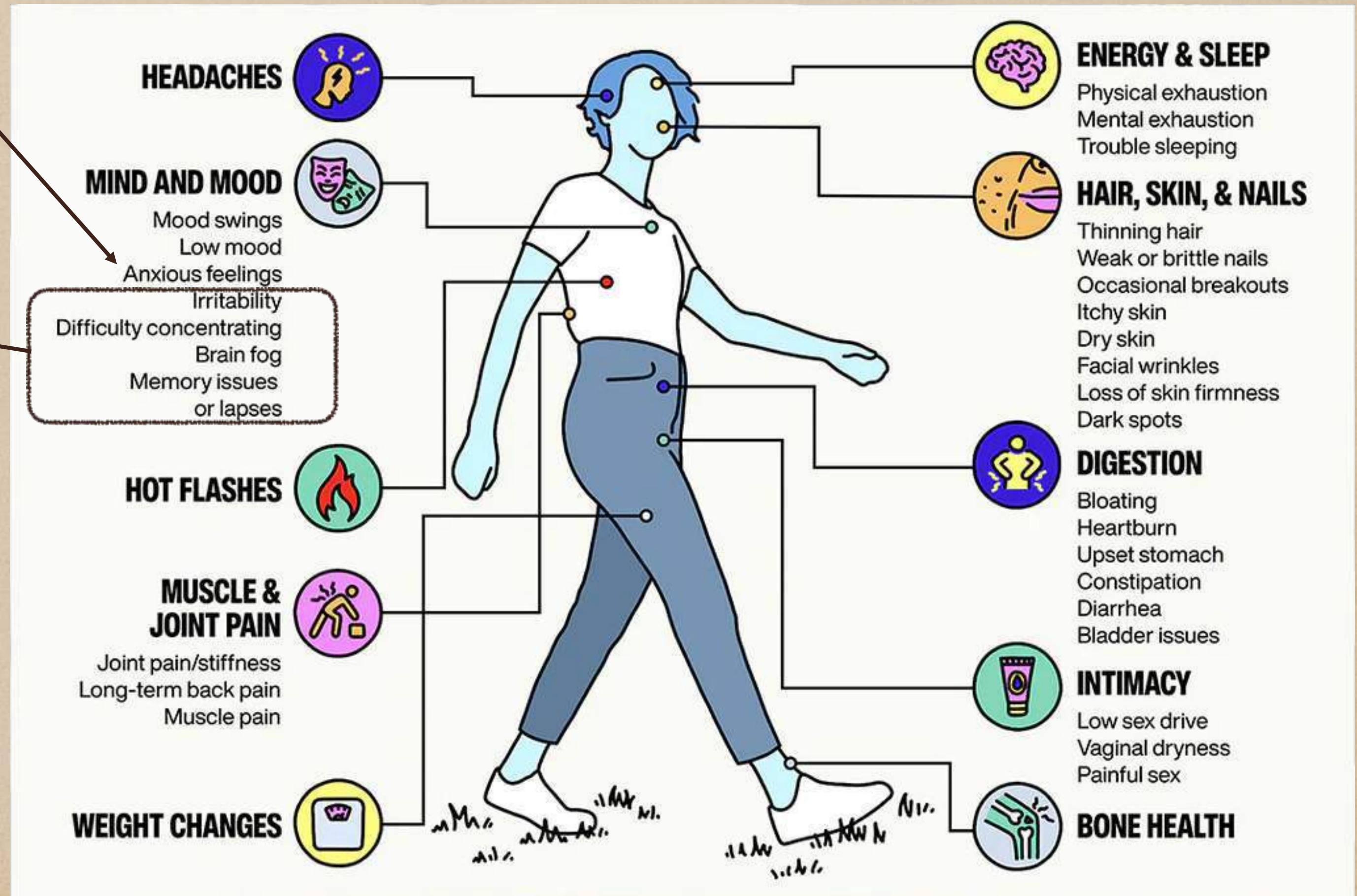


Common Signs of ADHD in Adults

1. Lack of focus
2. Disorganization
3. Forgetfulness
4. Distraction
5. Restlessness
6. Irritability
7. Impulsivity
8. Excitability
9. Low frustration tolerance
10. Boredom
11. Making careless mistakes
12. Poor time management
13. Poor stress management
14. Hot temper



“What am I to become...now?”



Diagnosis & Perimenopause

- Juggling Motherhood (often with ADHD or Autistic children), work, perhaps an oblivious and less than supportive partner (or partner with a predatory personality & intent on coercive control),
- Onset of perimenopause, with hormonal exacerbation of PMDD, maybe onset or worsening of hypothyroidosis, together with undiagnosed ADHD...and...
- Exhaustion at the end of each day; overwhelmed, feelings of burn out....episodic anxiety, periods of depression, threat response on high alert continuously, eating lots of salty, fatty, sweet food to soothe the limbic system, or drinking.
- An astute GP sends her to a Psychologist...who suggests she may have ADHD

Remember? *“Adults: male - female ratio close to **1:1** Why?...and So What?”*

Which is it - ADHD or Perimenopause?

- **Assess context:** medical history - remember immune relationship & inflammation, comorbidities; psychiatric history, if known, including AOD
- **Assessing perimenopause:** FSH & Testosterone, Menstrual changes, cardinal symptoms (eg night sweats, hot flashes), **clear *recent* timeline**
- **Assessing ADHD:**
 - **genetic lineage** - in parents/siblings/children...& not in partner,
 - ***longitudinal* history** of - core ADHD symptoms, impairment with masking & social anxiety, mood dysregulation, & change over adolescence (not always)
 - **exclude comorbid** psychiatric disorders if not already known
 - **explore changes** in relation to possible onset perimenopause

Which is it - ADHD or (Peri)menopause?

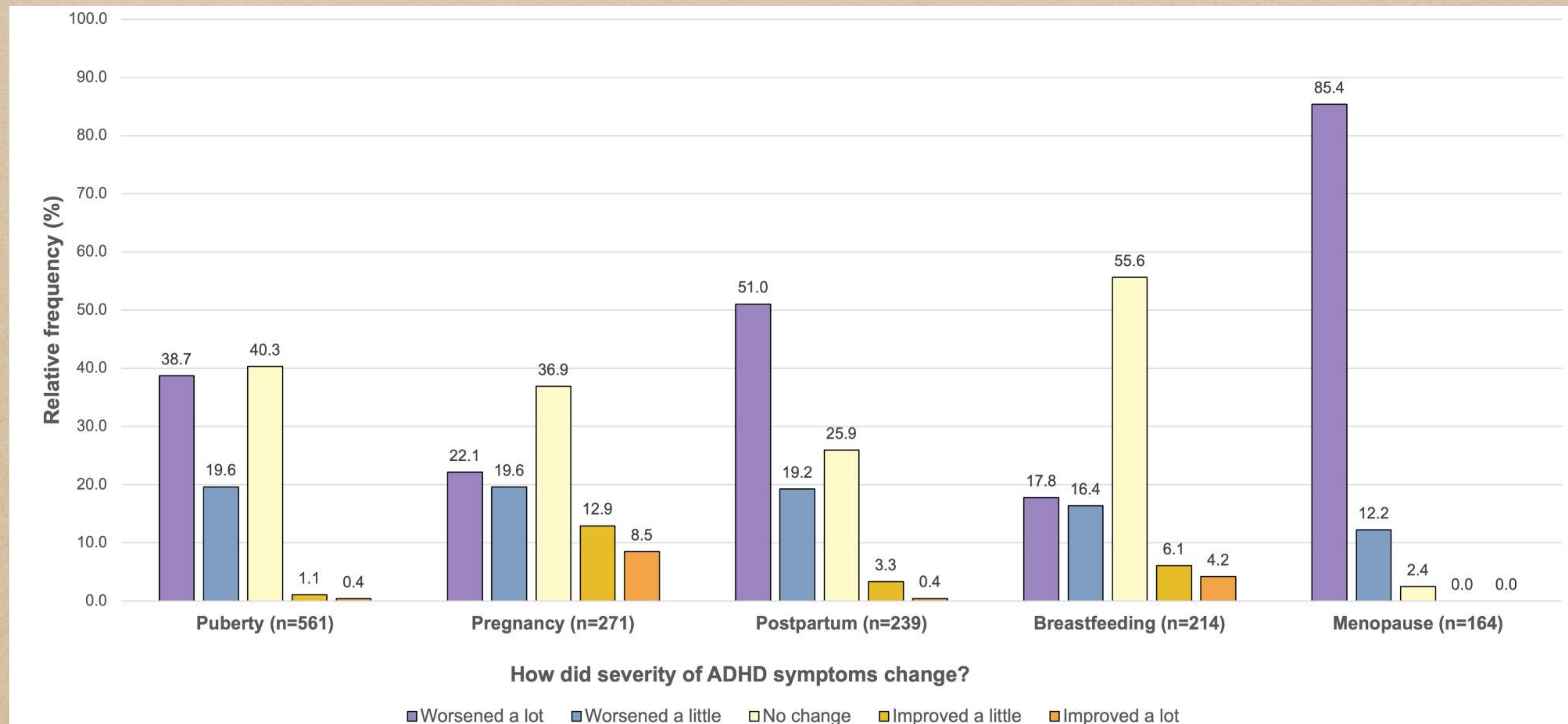
Things to consider in any woman over the age of, being very suspicious, 35 years rather than the conventional 42 to 55 years:-

- Hypothyroidism (sub-clinical, existing or de-novo)
- Residual “**Brain Fog**” - postpartum in an older Mother
- PMDD
- PCOS
- **ADHD**
- (Peri)menopause - & **low testosterone**

Menopause

- Menarche, Matrescence and now Menopause - the three times in life when a woman might ask the great existential questions:
 - Who Am I?
 - Am I Normal?
- ...and, in the 21st Century when life span grows ever longer,
 - What Will I Become?

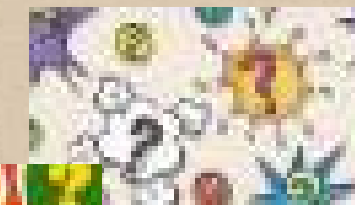
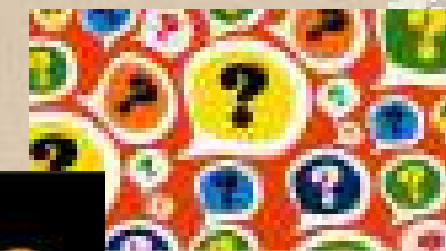
Survey of symptoms across hormonal life stages in 607 ADHD women (Osianlis et al, under review)



Last Things: Enabling (Treatment) in (Peri)menopause

- More research is needed...
- In late diagnosed ADHD, stabilise hormones first so as not to have to tweak medications later.
- In established ADHD & treatment, symptom and dose changes may indicate (peri)menopause: if HRT commenced or menopause established, then dosing can remain stable.
- Cardiac risks: slightly elevated risk in those with a vulnerability, warranting regular monitoring, but overall a small risk (Farhat et al 2025, Pliszka 2025).
- Dementia Risks: menopause may increase risks of dementia, with early menopause increasing this risk further (Briceno et al 2024, Dobson et al 2024).
- Dementia risks: ADHD increases risk of dementia (more strongly in men), with medication possibly reducing this risk (Levine et al 2023, Dobrosavljevic et al 2021).

QUESTIONS?



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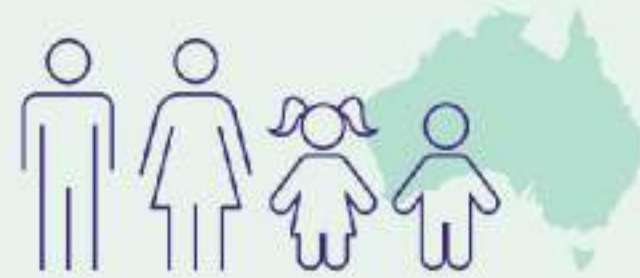
Trauma: Sobering Statistics

Trauma, violence, abuse and neglect statistics

An estimated

57% to 75%

of Australians will experience a potentially traumatic event in their lifetime.¹



Violence by an intimate partner



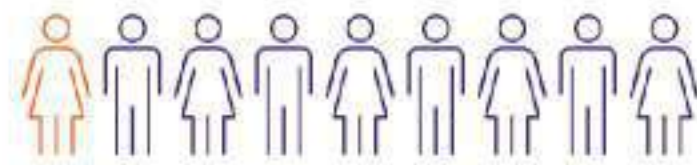
1 in 6 people
(16% or 2.9m)
experienced **violence**³
by an intimate partner⁴



1 in 4 women
(2.2 million)

1 in 13 men
(703,000)

Sexual violence



1 in 9 people
(11.7% or 2.2m)
experienced
sexual violence⁵



1 in 5 women
(1.7 million)

1 in 20 men
(428,000)

Extensive research indicates **violence, abuse and neglect** and other **adverse childhood experiences (ACEs)**⁶ have **serious outcomes** for women, children and men's **health**. These health and wellbeing outcomes are **cumulative** and may be **incrementally worse** for people experiencing **multiple types of abuse** or other ACEs.



Physical
injuries



Mental
health

1. Rossman, 2002 & Mills et al., 2011 cited in Bendall et al., 2018. 2. Copeland et al., 2007 & McLaughlin et al., 2013 cited in Bendall et al., 2018. 3. Physical and/or sexual violence since the age of 15. 4. Current and/or previous partner, girlfriend, boyfriend or date. 5. Sexual assault and sexual threat since the age of 15. 6. Physical and/or sexual abuse by an adult (18 years and over) before the age of 15. 7. Physical assault only witnessed before the age of 15. 8. In addition to violence, abuse and neglect, ACEs include parental substance abuse, mental health, separation, & incarceration.

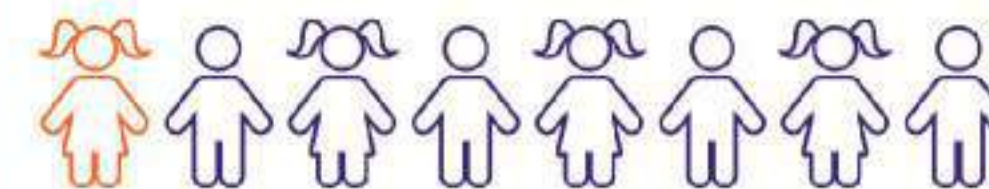
An estimated

half to two thirds

of young people have been exposed to at least one **traumatic event** by the time they turn 16.²

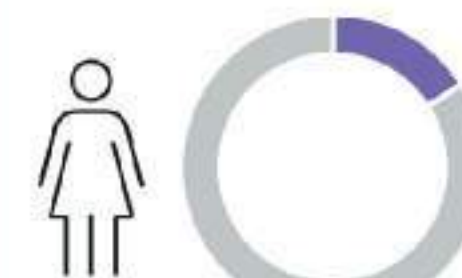


Child abuse (before the age of 15)



1 in 8 people
(13% or 2.5m)

18 years and over
experienced **child abuse**⁶



1 in 6 women
(1.5 million)



1 in 9 men
(991,600)

Witness violence to parent

1 in 9
Australians
(2m)

witnessed
violence⁷ towards
their **mother**
by a partner



1 in 22
Australians
(819,000)

witnessed
violence⁷ towards
their **father**
by a partner



Trauma-free Development

FUNCTIONS OF A WELL-INTEGRATED BRAIN

- Balancing your body: regulations and being in tune
- Attuning to others (openness and receptivity)
- Balancing your emotions (optimal flow neither too much energy/ arousal (chaos) or too depleted (rigid, depression)
- Emotional ability to extinguish fear inside self
- Ability to have response flexibility (stop, think before act)
- Insight into self (relate present to past and author future)
- Empathy (point self in another's point of view)
- Morality (capacity to think of larger social good and act on that sense)

Siegel, D. (2015) The Developing Mind

The Integrated Brain...

- is able to reason, think things through, and calm itself.

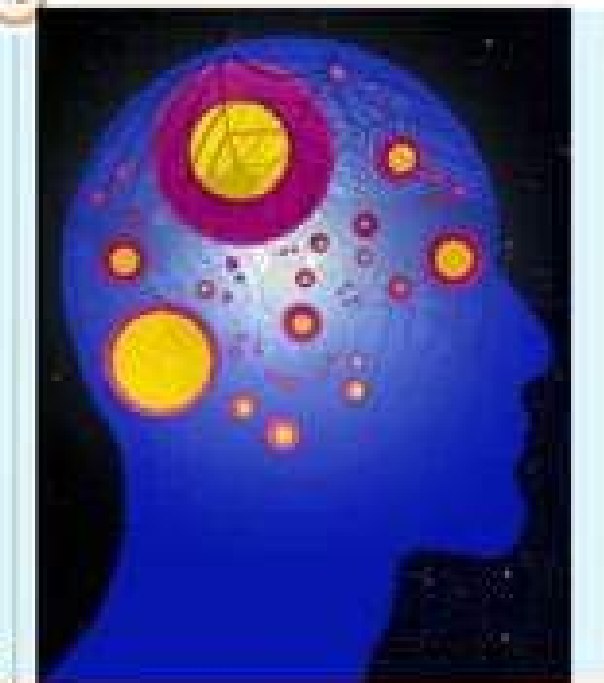


Image 6

Childhood Trauma: How it Looks in Adults

Hypervigilance: exaggerated startle, “on edge” (& fatigued), susceptible to criticism, sensitive “Fight, Flight or Freeze”.

Impaired relationships: anxious attachment, lack of trust, **poor self worth**, feelings of shame (often **SAD**), **rejection sensitivity**.

Impaired Emotional Responses: moody, anxious, over-react, **easily angered (fight response)**.

Depression and anxiety: hopelessness/**worthlessness**, little joy or motivation. On high alert - a continuous loop of anxiety and worry.

Addiction & Substance abuse: comfort eating (salty, sweet, fatty), alcohol, cannabis, Benzos to deal with emotional arousal and stress

Chronic Illness: vulnerabilities to diabetes, asthma, obesity, and allergies, and others

Developmental Trauma

- Basic mistrust of adults/inability to depend on others **Relatedness**
- Belief that the world is an unsafe place/bad things will happen and they are usually my fault **Certainty - Fairness**
- Assumption that others will not like me **Status**
- Fear and pessimism about future **Certainty**
- Feelings of hopelessness and lack of control **Autonomy**

But... Pause: Trauma... & Hormones?

- Evidence shows clear links between early life trauma and adolescent and adult mental disorder, especially depression, anxiety & BPD/cPTSD (but see ICD-11 and alternative concept).
- Emerging evidence suggests **early life trauma may sensitise hormone systems**, in addition to the threat response system.
- Notably, **symptoms** related to past trauma are **exacerbated** at phases of the **menstrual cycle** (Mu, Thomas, Kulkarni 2022)

Hormones, Matrescence, Trauma and ADHD: The Emotional Landscape

The physical changes wrought in matrescence and in the development of **ADHD** lay a foundation for the action of **hormones and trauma**.

Trauma and Hormones separately & together are marked by emotions and their dysregulation.

Such emotions can cloud judgment and lead to decisions based on immediate emotional relief rather than long-term benefit, compounded further by cognitive impairment.

What To Do?

Perinatal Environment



De-stigmatise



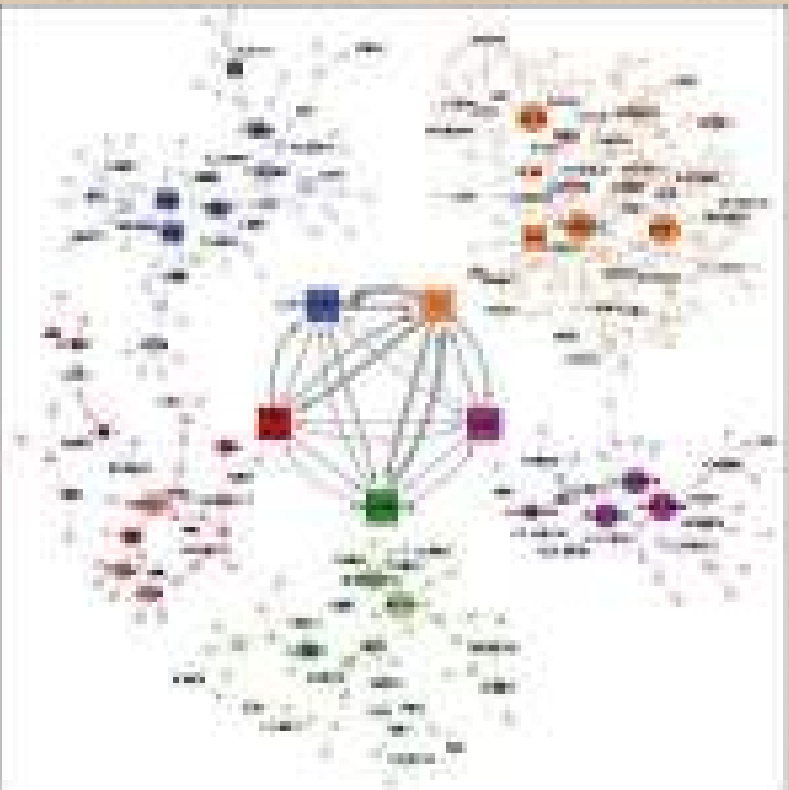
Identify & Treat Early



Developmental Environment



Educate



Research -
in Females

